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MEDICAL ASPECTS OF DENTAL HYPOPLASIA AND CARIES IN CHILDREN

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Systematic examination of school children begun about fifteen years ago, called the attention of the laity, dental profession and those interested in the medical care of children to the strikingly high incidence of carious teeth. The percentage ranging from eighty to ninety. The incidence in England according to Still, was nearly parallel.

I am of the opinion, though no statistics are available, the preschool child will show an equally high percentage. Till this time but little attention had been paid to prevention or treatment of decayed teeth or oral infection. At the present time many experiments are being carried out and interesting observations made by such research workers as M. Mellanby, of England, Percy R. Howe and Hanks of this country, the conclusions of whom I shall refer to.

A. T. Pitts (Garrod's Diseases of Children, 2nd. Edition) defines hypoplasia as defective calcification of the teeth, leading to pitting, discoloration or actual loss of part or whole of the enamel with irregular calcification of the dentine. Thus dental hypoplasia finds a place in this discussion because defective calcification probably is a predisposing cause to dental caries. Hypoplasia may affect both the deciduous and the permanent teeth. If the deciduous, it must be active at about the fourth month of intrauterine life, at which time calcification begins and continues till only a few months after birth. It is during this time that the factors concerned in its production must be sought and M. Mellanby suggests it is due to vitamin deficiency in the mother's diet at this time.

Hypoplasia of the permanent teeth as evidenced by pitting, transverse striation, etc., occurs during the first six to seven years of life. Many acute and chronic diseases profoundly affect the teeth. Both tooth structure and general development are influenced. The effects are noticed during the course of the disease or during convalescence. Those conditions which affect nutrition stand foremost, especially those of the gastro-intestinal tract, and the so called deficiency diseases, such as scurvy, rickets and pellagra. Same is true of acute diseases such as scarlet fever, measles and diphtheria.

Children suffering from ductless gland disorders, as the Cretin, have defective teeth with a tendency to decay early. The constitutional diseases, tuberculosis and syphilis, furnish a picture familiar to every practitioner and dentist, with their early tendency to decay.

Now the condition which I have here attempted to describe is of course, not the picture of dental caries but, I think, indissolubly associated as a contributing factor. The dark worn down tooth may illustrate this condition best, though no caries be present.

By dental caries is meant the progressive destruction of the calcified tissues of the teeth, often with infection and a resulting pus formation. Dental caries is an important source of disease in early life and one too often overlooked by both laity and even those who have to deal with the diseases of childhood. Effects (more or less remote) for which carious teeth may be responsible:

1. Digestive disorders with wasting due to bolting of food or from septic absorption.
2. Loss of appetite.
3. Anemia at times quite profound.
4. An alveolar abscess may form

as the result of death and infection of the dental pulp, resulting in so called "gum boil" or "sinus."

5. Involvement of adjacent lymph glands. These glands being permanently damaged may represent a "locus minoris resistentia" thereby predisposing to tuberculous adenitis.
6. Still says dental worry in a child may be the starting point of facial "habit-spasm," which disappears after dental care of carious teeth.
7. Severe headaches of fleeting nature may be a result.

On the other hand illness in childhood may produce dental caries as above referred to. It is impossible to deny the hereditary tendency in certain families to caries and as some dental authorities claim, there may be an inherited tendency to thin and imperfect enamel, just as one child may have fine hair and another coarse. Seemingly there is more than one cause for dental caries. These might be grouped under:

1. Heredity.
2. Hypoplasia as a result of improper or deficient diet, infections, acute or chronic.
3. Acid formation of a metabolic nature plus the acid condition of the mouth, resulting from excessive bacterial fermentation, or adherent carbohydrates about the tooth, with resulting damage to the enamel, which often marks the beginning of caries.

These three conditions may represent successive phases in production of caries.

M. Mellanby of England, Howe and Hanke, this country, have suggested, after much experimental work, the association of vitamin deficiency, as a cause of hypoplasia and dental caries. Mellanby states that good or bad calcification of teeth can be produced at will by altering in the diet the relative amounts of calcifying vitamin as contained in milk, egg yolk and cod liver oil; vitamin A and D.

(Pearson & Wylie) These observations bring out the importance of diet and especially of vitamin D in relation both to the growth of the teeth and development of caries, and just as this vitamin helps to prevent and cure the bone and teeth changes in rickets, so too, it is obviously necessary for the proper development of teeth in all children. It is likely, too, that vitamin B has a share in the "building up" process in the teeth, as well as the bones. Boyd of the University of Iowa, reports some interesting observations conducted there. A specially prescribed diet seeming clinically to bear out the findings of Mellanby as to the direct action of diet on caries.

It must be clear from the foregoing brief and incomplete sketch of some of the dental problems of infancy and childhood, that the pediatrician must have a definite interest in preventive dentistry.

Patient inquiry, careful systematic and intelligent examination will commonly reveal the underlying cause of the disordered nutrition which reflects itself in the oral condition and points out the way to proper relief.

J. D. Boyd, of University of Iowa, has shown how something may be brought home in a practical way, in the management of these cases. Boyd chose a group of children, from the orthopedic service, with dental caries of varying severity, prescibed a special diet to be taken daily and with whatever they cared for in addition to this form the regular menu. With practical uniformity all showed an arrest of the caries, as evidenced by the change in the consistency of the dentine from the initial state to one of stony hardness with no advance in the destructive process. A specially prescribed complementary diet for each child was given, such as is designated, "one high in mineral and vitamin content," and thus favoring calcification. Special daily diet consisted of:

Whole milk, one quart.
Cod liver oil, one teaspoonful.
Yolk of one egg.
Juice of one orange.
Butter, one ounce.
Two green vegetables.

Prevention of Caries: It will be evident from the foregoing remarks that a very broad view must be taken of the subject of caries, and that its prevention can only be hoped for if we envisage not only local, but general factors in its causation. In the first place investigations have clearly shown that predisposition to caries occurs in early infancy, not only as the result of

rickets, but apart from this disease, as the result of improper feeding. Further, that caries of the temporary teeth forms one of the most profilic causes of derangement of their permanent successors with consequent deformity of the maxilla. This fact is not sufficiently realized, and the tendency has been to minimize the importance of preserving the temporary teeth until they are normally shed. Since caries is largely responsible for premature loss of teeth, it is of great importance to endeavor to control its onset at the earliest age. Prevention of caries can be attained by attention to:—general hygiene, including sufficient fresh air and sunshine. (Prenatal). Diet:—This must not only be properly balanced as regards salts and other ingredients but contain sufficient vitamins such as prescribed above, A and D.

It should be seen that diets contain sufficient fat, protein and salts, and that vegetables and fresh fruit are amply represented.

The importance of breast-feeding for the sake of good teeth, as well as for other reasons, cannot be too strongly insisted upon.

Oral Hygiene: Artificial cleansing by use of tooth brush, night and morning and after meals is to be encouraged as a habit early in childhood, but does not prevent caries.

The cooperation of the dentist should be sought and caries in the early stages can be treated by conservative measures with considerable success. But as pediatricians we voice the dictum that where a tooth is too bad to be filled it's bad enough to be pulled.

CONCLUSIONS

Prenatal care.

1. Deficiencies in the pregnant mother's diet may have to do with the structure of the deciduous teeth. What diet in the mother?

2. Food factors in the development of teeth:

   (a) Foods having high mineral content as milk, butter eggs, cod liver oil and orange juice.

   (b) Fresh fruits and vitamins.

3. Oral hygiene to be encouraged.

4. Dental advice and examination by a competent dentist twice yearly.

CLINICAL OBSERVATIONS ON THE USE OF A LIPOIDAL EXTRACT OF CORPUS LUTEUM: LIPO-LUTIN

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Early in the history of the study of internal secretions, the Graafian follicle and corpus luteum were recognized as factors in the menstrual cycle. For many years the medical profession attempted to treat various dysfunctions with luteal preparations. Results in the main were discouraging and luteal therapy fell more or less into disrepute.

The development of the "vaginal smear" method for determining the potency of any ovarian hormone—the credit for which goes to Allen and Doisy—and the use of this in the standardization of hormonic preparations into "rat units" has explained many of the former difficulties and placed this matter of gestational hormone therapy on a newer and more rational basis.

Thousands of papers have been written on the theory and theories of the interrelationships existing between the Graafian follicle, the corpus luteum, the interstitial cells of the ovary, the pituitary, not to mention the placenta, the amniotic fluid, and other still less related structures. It is not our purpose to argue the theory nor yet to review the literature. Our position on the theory was explained in a paper read before this body at a previous meeting. The purpose of this paper is to step wholly into the field of therapy and give for your consideration some observations on the use of lipo-lutin, a potent lipoidal extract of corpus luteum, which is prepared by Parke, Davis and Company.

In a discussion of this kind, it is almost imperative to use a disconnected or note method of presentation. The subject naturally divides itself into two divisions; the use of corpus luteum in the pregnant and in the non-pregnant.

In the pregnant state, the condition which is first brought to our attention is the characteristic nausea and vomiting. It is here that the watery extract of corpus luteum provided so many disappointing results. Let me state that we do not minimize the neurotic element which plays such a large part in the condition, nor do

we neglect the routine care of these cases by dietetic regime and the removal of irritating factors as far as that may be done. However, we do not subscribe to the theory that the nausea and vomiting of pregnancy is purely a neurosis, for it seems impossible that such a large percentage of women should develop this condition in the first tri-mester of pregnancy. While it has never been definitely proved that there is a deficiency of corpus luteum or its hormone in this period of pregnancy, yet during this time the organism is under an excessive strain in adjusting itself to its new economy; and this means, in the last analysis, endocrine adjustment. Since the luteal body is the new factor in this adjustment, it is not unreasonable to suppose that it is the dominating factor in this condition.

For some time it has been our practice to use injections of lipo-lutin for this condition with what we feel are very gratifying results. In our small series of some twenty cases, nausea and vomiting have been practically completely controlled within twenty-four hours, in most cases never to return except as an occasional slight nausea in the morning. In a few cases a second or third dose has been required at intervals of one or two weeks. Occasionally, the results are startling.

Case No. I: Mrs. S. J. S., 25, para 2. The first pregnancy resulted in an uncomplicated miscarriage at three months in July 1928. Family history negative, her personal history shows a "nervous breakdown" at the age of eighteen. However, she seems to be very well stablized and free from the usual nervous traits. Last period the 29th of September, 1929. On November 29th she came to the office complaining of excessive nausea and vomiting, onset two weeks previous, with the severity increasing, so that for the past four or five days she had been unable to retain any food. She looked sick. Gave one ampule of lipo-lutin subcutaneously. The next day she returned, her appearance entirely changed and stated that she felt fine but that she "was afraid she was going to vomit once when she ate some very rich turkey hash." Nausea and vomiting has never returned even though she had a very severe cold early in February.

Case No. II: Mrs. L. S. B., 20, para one. History of pus appendix with removal in 1925, tonsillectomy in 1920, subsequent health excellent. Last period May 8, 1929, was seen on July 15, suffering from nausea and vomiting, very profound, of two weeks duration. Had lost weight and showed some water loss. One ampule of lipolutin was given, resulting in a marked improvement the next day which allowed her to retain some food. After three days a second ampule completed the stabilization. Her improvement was so marked that she insisted on an ampule at ten days to two weeks intervals for a month although at no time was nausea and vomiting excessive.

Threatened abortion is a factor ever to be feared in pregnancy. It ranges in severity from slight nagging pains and a bearing down feeling through all its gradations of severity to the woman who aborts as regularly as she becomes pregnant. In our experience, the symptoms and the danger are greatest at the time of the recurring menstrual cycles. Many factors play a part in this phenomenon. If the cause be a degenerate sperm or imperfect ovum with the consequent abnormal fetus as a result of fertilization, then of course we perform a real dis-service if we can and do prevent the abortion. As a matter of fact these cases usually go on to inevitable abortion. The more usual factor is pelvic inflammation which results in an increased sensitivity and irritability of the uterine muscle.

Whatever the factor, then, toward the abortion, the mechanism of the abortion itself is the same as the mechanism of full term labor. The corpus luteum degenerates; its hormone disappears, with the resulting release of the oxytocic principle of the pituitary hormone. The same rhythmic contractions of the uterine muscle result. We believe that the same mechanism operates in the sub-maximal cases; that at the period time there is a lessening in the effectiveness of the luteal hormone and a consequent relative increase in the blood stream of the oxytocic principle of the pituitary. This results in uterine cramps whose severity is proportionate to the preponderance of the pituitary. If this reasoning is correct, then a potent luteal extract should control these symptoms and prevent the abortion.

This has proved true in our experience. Indeed, in one case of inevitable abortion with the presence of five months twin fetuses, dead for some time, the conclusion of

the labor was delayed three days by the use of lipo-lutin alone, one ampule holding the pains in complete abeyance for twenty-four hours at a time. We have already reported a case of fourteen abortions without a living baby which was carried to a successful conclusion on the fifteenth pregnancy by the use of potent corpus luteum. It is our custom to give, subcutaneously, one ampule of lipo-lutin immediately upon the appearance of these cramping uterine pains during pregnancy or upon the evidence of an increased irritability of the uterus. So far we have been very gratified with our success (as it has produced an immediate amelioration of the symptoms). In those cases where there is a history of one or more abortions since the last successful pregnancy, we employ this as a routine measure five days to a week prior to each menstrual cycle. Needless to say, the neurotic element does not enter into this condition and it cannot be charged that suggestion is responsible for results. Case reports could be multiplied but there seems no need for them in this connection.

In the non-pregnant state, lipo-lutin has produced results in those cases of menorrhagia which were systemic or endocrine in origin. It would, of course, be unreasonable to expect to control hemorrhage due to retained secundines, uterine and cervical cancer, or fibromyomata. It is a little more difficult to understand the rationale of treatment in these cases when degeneration of the corpus luteum and the loss of the luteal hormone are the physiologic factors which permit the onset of menstruation. It is perhaps reasonable to assume that the luteal hormone acts as a governing factor or check upon the other endocrine glands involved and that its disappearance is so complete at the onset of menstruation, that uterine bleeding continues excessively or even indefinitely. Whatever the mechanism, the following case reports are excellent examples of the efficacy of the luteal hormone to control the untoward phenomona.

The first case is an extreme menorrhagia in a young girl without other pathology than an endocrine imbalance.

Miss M. T., 16, gives an essentially negative family history, her personal history negative except for very severe recurrent tonsillitis which was cured by a tonsillectomy in 1928. Her first menses was at the age of thirteen, was free and painless, lasting nearly a week. From that time to the age of fifteen, the periods were very irregular, sometimes two or three months apart, but the flow was excessive, lasting six to eight days. At about fifteen, her periods became regular, the character of the flow being unchanged. Beginning in September, 1929, the duration of the flow increased and in October, 1929, she flowed constantly for three weeks. Hemoglobin count at that time was 45%. From that time on the condition grew rapidly worse and the girl was scarcely ever free from bloody discharge. The amount of flow increased throughout January and February. When first seen on March 17 in consultation with Dr. W. C. Mitchener of Okmulgee, and Dr. W. G. Bisbee of Bristow, she had been flowing constantly for two weeks and on March 15, had begun to have an extreme uterine hemorrhage. Her hemoglobin had dropped to 12%, her red blood count 1,200,000. Rest in bed, the various oxytocic drugs, ice packs, etc., had proved entirely unavailing. Examination showed a small hypopituitary type girl, profoundly exsanguinated, slight tenderness in each iliac fossa, and a temperature ranging up to 101 degrees. Examination showed no evidence of pelvic infection and no possibility of pregnancy as a factor. She was given one ampule of lipo-lutin and by morning of March 18, the hemorrhage was nearly controlled. The second ampule caused a complete cessation of hemorrhage. Her anemia was controlled by blood transfusions. No uterine bleeding until April 23 when she flowed five days very freely and then stopped. No further periods have occurred.

The menstrual flow in tuberculosis is generally considered to be very harmful to the patient since it depletes the blood supply and with its accompanying nervous phenomena, increases the metabolic activity of the patient to whom rest is so essential. Many men studying this subject are recommending and practicing the temporary removal of menstruation by radiation of the ovaries.

When, as often happens in incipient tuberculosis, the menstrual flow is not only present but assumes the magnitude of menorrhagia, the problem becomes acute. In the one case of incipient tuberculosis with menorrhagia which we have seen, the menstrual flow would last from ten to twenty days out of each month and the general

condition was definitely harmed thereby, as evidenced by increased elevation of temperature and weakness. The exhibition of one ampule of lipo-lutin at the onset of the period would cause a cessation of the flow within twenty-four hours without re-occurrence until the next cycle.

The third case illustrates the use of lipo-lutin in those cases of menorrhagia with irregularity of the menstrual periods where a causative factor is general exhaustion, physical, mental, and probably sexual.

Mrs. J. T. D. is 31 but looks 45. She complains of many varied and ill-defined pains—headache, backache, and of a "tired feeling"—which makes her unable to apply herself to her regular work which is that of a household helper. She states that for many months her menstrual periods have been very irregular, occurring as often as every two weeks, the flow lasting from seven to ten days with excessive flow and some clots for the first four or five days during which time she has a lot of pain. Her history shows she is the mother of four small children with several miscarriages, some of them probably induced. Besides caring for her home, she supplements the family income by doing odd jobs of house work or going out at night to care for children. Her husband works only when it is forced upon him; at the same time he objects to her working as it leaves him alone when he is out of work. Their choice of amusement does not help the picture as it consists of attending and participating in every "holy roller" meeting in the county. Examination shows an undernourished, frail little woman, highly nervous. There is no definite pathologic entity disclosed upon examination. Pelvic findings are absolutely normal. The use of an ampule of lipo-lutin at the onset of menstruation reduced the flow to three days. By its use over a period of two months, aided, of course, with tonics and sedatives, the general condition improved; the menstrual periods became regular at twenty-eight day intervals, and the average flow was reduced to four days with a normal quantity. When last seen, her menstrual condition had been perfectly normal and her general condition was much improved.

Two other conditions of the non-pregnant state are undoubtedly endocrine in origin and should furnish a field for therapeutic investigation. Theoretically, at least, the dysmenorrhea due to excessive spasm of the infantile uterus and the distressing irregular menorrhagia of the menopause, should yield to potent luteal therapy. It is our hope that later we may be able to report our findings in these conditions.

CONCLUSIONS

1. The therapeutic indications for corpus luteum need revision and re-study since we now have a lipoidal extract, lipo-lutin, which is stable and potent instead of the watery extract which proved to be practically inert.

2. Lipo-lutin is a very powerful adjunct in the treatment of nausea and vomiting of pregnancy, sometimes acting almost as a specific.

3. Lipo-lutin will increase the luteal hormone preponderance in the system thereby counteracting the oxytocic principle of the pituitary. It thereby eliminates the uterine contractions and pains which occur most frequently at the menstrual cycle time, makes the patient more comfortable, and undoubtedly in certain instances, prevents abortion.

4. In the non-pregnant, lipo-lutin controls the hemorrhage in those cases where the causative factor is endocrine and not mechanical.

5. Dysmenorrhea and the excessive hemorrhage of the menopause furnish fields for the further investigations of this product.

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DISCUSSION: *Geo. R. Osborn, M.D., Tulsa.*

Dr. Glismann's observations are extremely interesting. I want first to commend his method of making his deductions or observations, from what appears to be well kept records of his cases.

No accurate conclusions can be made from any series of cases or experiments when one depends only upon his memory.

Lipo-lutin is without doubt more potent than the aqueous lutein extract. I have used it in the treatment of vomiting of pregnancy with astonishing results, in fact the results were so marvelous that I have become a little suspicious because I have seen cases respond similarly to glucose solution administered intravenously. Cholelith pills have likewise cured a number of patients. I agree with the doctor that the percentage of cases of hypereme-

sis, due to neurosis has been over-estimated. We all know that many of these women are sick. I do not like the term "neurosis," it doesn't mean much to me. A man may have a severe headache, one that will not respond to aspirin, acetidine, et cetera, but put him on a golf course and one good drive will cure his headache. I wouldn't say his headache was a neurosis but I would recommend golf for that kind of a headache.

I think this paper is valuable in that it is suggestive of what we do not know about endocrinology and that research in the near future will solve many of the mysteries and change many of our present ideas of human physiology. Some day we will know our hormones as the poultryman knows his eggs. What we actually know of them now is comparable to what was known of electricity when Benjamin Franklin flew his kite.

Lipo-lutin does prevent abortion, it inhibits uterine contractions. I think we should, however, think of this remedy as the extract or hormone from the lutein corpuscle and try to forget this trade name. In so doing we will be less empirical and much more scientific.

I want to thank Dr. Glismann for this paper because I think many, like myself, need our enthusiasm revived occasionally to encourage us to be on the watch that we do not become victims of routine and thoughtless procedure.

DISCUSSION: *Dr. H. J. McGuire, Tulsa.*

In discussing this paper there are some points I want to bring out, however, if I am entirely wrong please forgive me. Dr. Glismann states that the question of metrorrhagia or menorrhagia in tuberculosis is a common thing. In my understanding, however, menorrhagia is not a common thing in tuberculosis. On the other hand, it seems to me the policy of Nature to maintain a sort of balance in this condition by amenorrhea; and that both in toxic thyroid and tuberculosis instead of having increased flow at the menstrual period we have decreased flow, and in my experience and with what little I have read, I believe that amenorrhea is the thing that we find instead of menorrhagia. I would like to ask Dr. Glismann the question of whether or not and in what percentage of cases he has found increased flow instead of decreased flow in tuberculosis. The other thing I would like to ask him about is the statement regarding the use of a drug by mouth, ovarian extract or corpus luteum extract. In my understanding, I feel that any ovarian extract, tablet or capsule form, that the gastric juices destroy whatever activity that drug may have, and I wonder if Dr. Glismann may tell me what particular ovarian extract or what two particular ovarian extracts may cause that so-called reaction we may expect by having the patient spend five or six dollars for one hundred capsules.

Dr. J. F. Kuhn, Oklahoma City: I think the important part of the discussion was touched upon by Dr. Osborne in his closing sentence, and should be given a great deal of consideration. What does routine mean in the use of some remedy that you hope will give results, particularly is this true in the menorrhagia near the menopause. It is likely to be a dangerous procedure, therefore, the various drugs, in the hands of the average practitioner who fails to give proper study of each case and who fails to make complete routine examinations before giving the drugs. It is quite a common thing to undertake some experiment with drugs to see if the patient is going to be benefitted. Many fail to study their patient before determining upon treatment, and this is likely to lead to just that. No woman has been examined unless a very careful and thorough examination of the pelvis is made before any therapeutic treatment is determined upon.

Dr. J. E. Hughes, Shawnee: Based on the assumption that vomiting of pregnancy may be due to disturbance of the hormones, the giving of whole blood, taking the blood of the husband, one ounce, and then in 24 hours repeating this, has been in my observation of great benefit in a great many of these cases. They react with results that are almost magic. But I wonder whether or not the theory of the vomiting of pregnancy is correct, whether the true cause is not due to disturbances of the sex hormone.

Dr. W. A. Dean, Tulsa: I have a patient whose appendix and right ovary were removed at the age of 17, and just after she had gotten pregnant she had a cystic left ovary removed. I tried giving corpus luteum and carried this on through the nine months and she had no miscarriage.

Dr.———(Name not given): This is an

excellent paper, and I think shows more or less experience. The professors of obstetrics used to tell us where we find everything recommended for one particular disease, none of them are very good, and that is my experience lots of times with vomiting of pregnancy, or was until corpus luteum came along. I remember once an oil man's wife came to me and said, "Doctor, I believe I am pregnant and I haven't been that way for ten years. I just can't stand the vomiting and nausea." This was the fifth week. I happened to think of corpus luteum, and she was magically helped. She came every five days for the nine months, and it gave her a good deal of satisfaction. I have a great deal of confidence in its use in metrorrhagia and menorrhagia as well as in the nausea and vomiting of pregnancy.

Chairman: If there is no further discussion, I will ask Dr. Glismann to close.

Dr. Glismann: Mr. Chairman and gentlemen. I want to thank you folks for your very generous discussion of this paper. In regard to Dr. Osborne's two particular points, that we do not know the hormones and do not know all their relations, that is perfectly true. As I said in the paper, I have made no attempt either to report on the theories or to explain the results of these cases on the basis of theory. I have given you the results in the few cases in which we have tried this thing out, with one idea, the idea that you will recognize it and bring more light to bear upon the results of corpus luteum. It is only upon patients that we can learn the effect of drugs or medication of any kind, and that is one reason I read the paper. That of course brings up Dr. Kuhn's point, that examination is essential. Certainly it is essential. If we are to draw any adequate conclusion we must know the condition of the patient which we are treating. Dr. McGuire, in reply to your questions, I am not going to discuss the proposition of oral therapy; I will leave that to my friend, Dr. Turner, and I will not discuss oral administration. As for your other point, excessive bleeding in tuberculosis, we will grant you the usual thing in late tuberculosis or the advanced stage is amenorrhea. On the other hand, I bring to your attention this one case in a series of cases; I bring to your attention that menstrual periods in the tubercular, and it occurs early in tuberculosis, are a disadvantage. I think this is recognized by all those who have much to do with tuberculosis, and in this case which I had where there was excessive bleeding in tuberculosis, corpus luteum worked very well. There was an article about this in the A.M.A., an article by Costellani in Italy, who made this same observation in a series of cases. I can get that article for you. That paper was written two years ago. I remember his name and that he was Italian. I am glad to see that in the past two years Dr. Osborne and Dr. Dean have used this, apparently following my previous paper—I appreciate that honor very much—and found corpus luteum successful in preventing abortion. I think that is very important, and I am delighted to find that Dr. Osborne feels it useful in nausea and vomiting of pregnancy. Dr. Hughes' suggestion of injection of the husband's blood is aside from this paper, and I know nothing about it and cannot discuss it. Thank you very much.

MENINGOCOCCIC MENINGITIS

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This paper presents an analysis of 163 cases of meningococcic meningitis treated at the Isolation Hospital, St. Louis, during the years 1916-17-18 and 201 cases during the years 1926-27-28. The greater part of the discussion, however, will deal with the routine treatment, course of the disease and results which were obtained in the later series. The comparison of these two three-year periods is made in order to emphasize the more favorable results which seemed to follow certain changes in the method of treatment. A three-year period is sufficient to give a fairly large series of cases and will lessen the importance of such factors as seasonal variation, strain of organism, differences in age, sex, color and social condition of the individuals in two groups.

Meningococcic meningitis is an acute infectious and contagious disease due to the diplococcus meningitis which usually involves the meninges of the brain and spinal cord, but may invade the blood stream and other organs. The onset is abrupt with persistent headache, nausea, vomiting, irregular temperature and pulse, pain in the back of the neck or along the vertebral column, followed by stiffness of the neck and back, restlessness and irritability or

occasionally stupor. Such symptoms are not limited to the epidemic form of the disease but may occur in meningitis of other types. In some of the cases of meningococcic meningitis, small reddened macules are scattered over the trunk or extremities, sometimes described as "fleabite" hemorrhage, and are an aid in diagnosis.

When we see a patient with some or all of the above symptoms, associated with stiffness of the neck, rigidity of the muscles along the vertebral column, or a positive Kernig or Brudzinski sign, we make a skin test for sensitization to horse serum and do a lumbar puncture. The sensitization test is started at this time in order that it may be read after the lumbar puncture is finished. If, on puncture, the spinal fluid appears turbid, milky or purulent, a sufficient amount of fluid is allowed to escape slowly to lessen the intracranial pressure, and anti-meningococcic serum is administered intraspinally without removing the lumbar puncture needle. This saves the patient another lumbar puncture if, after the fluid is examined in the laboratory, it is presumed or proved to be meningococcic in type, and probably doesn't harm him if it should be any other type of meningitis. As soon as the intraspinal injection is completed, serum is given intravenously if the skin sensitization test is negative. Serum is injected intraspinally in all cases presenting turbid, milky or purulent spinal fluid for the reason that there is no way of differentiating types of purulent meningitis on the gross appearance of the freshly removed fluid. A purulent meningitis with a polymorphonuclear cellular reaction in the spinal fluid and an absence of organisms is presumptive evidence of a meningococcic infection. Positive evidence is afforded only by finding the meningococcus on direct smear or cultured growth from the spinal fluid or blood stream.

If after laboratory examination the case is presumed or proved to be meningococcic meningitis it is our practice to administer serum intravenously and intraspinally at 12 hour intervals for three or four doses, after which the interval is lengthened to 18 or 24 hours. Rarely do we give more than three injections into the vein, and once intravenous serum has been stopped for three days we do not again attempt it without using desensitizing doses.

If, during the removal of spinal fliud, the patient complains suddenly of headache, or, if unconscious, he screams as if in pain, the flow is stopped for a few seconds and fluid again allowed to escape slowly until the headache recurs or until the pressure has been relieved. 20 cc to 50 cc is the usual amount of spinal fluid removed.

The average dose of serum which we gave intraspinally to a child was 15 to 20 cc and to an adult 20 to 30 cc, *given under gravity pressure only.* The intravenous dose we used was 15 cc for a child and 30 cc for an adult. In general, the quantity of serum injected at one time intraspinally is less than the amount of spinal fliud removed, and this practice should be observed for three reasons:

1. To relieve intracranial pressure.
2. To allow for freer circulation of the serum intraspinally.
3. To leave room for the increased production of spinal fluid which will follow as a result of the disease itself and the irritant properties of the horse serum.

At successive punctures, serum of different biological manufacturers is used since it is possible that one serum may contain antibodies for a particular strain of meningococcus which is absent in another serum. The administration of serum is continned until the spinal fluid is organism free and until the patient is clinically much improved, or until he has had a total of six or eight intraspinal injections, after which time we frequently do a lumbar drainage without administering further serum. Following the introduction of serum at the lumbar level, the foot of the bed is elevated sufficiently for two hours to keep the point of injection higher than the ventricles of the brain.

It occasionally happens, and especially after repeated punctures at the same lumbar level is it likely to occur, that no spinal fluid is obtained though it is evident that the puncture is properly done. This is usually due to blockage higher up in the canal caused by adhesions from the inflammatory process itself or to the trauma of repeated lumbar punctures. If a slight flow occurs at the lumbar level and then ceases, pressure on the jugular veins will cause definite increase in the rate of flow

if no blockage exists. Should pressure on the juglar veins not affect the flow, it indicates that there is an obstruction and justifies going in at a higher level. (Figure I. shows such an obstruction at the first lumbar level. Lipiodol was introduced into the cisterna magna when lumbar puncture failed to yield fluid). When a blockage exists, a puncture at the next or second higher lumbar level will many times give fluid, but if this fails we resort to puncture of the cisterna magna entering below the base of the skull. The technique of the puncture of the cisterna magna, as described by Ayer[1] is as follows, Fig. II[2].

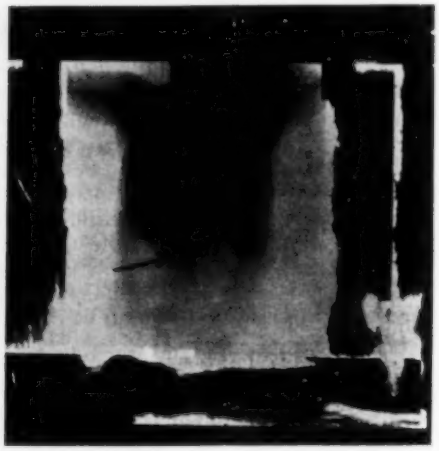

Figure I

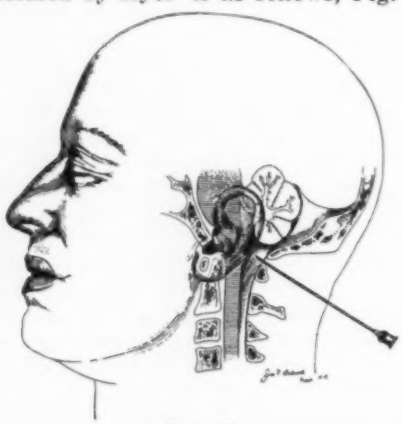

Figure II

"Place the patient on his side as for lumbar puncture, maintaining the alinement of the vertebral column and flex the neck moderately. The thumb of the left hand is placed on the spine of the axis and the needle inserted in midline just above the thumb. The needle may be rapidly pushed through the skin but should then be cautiously and carefully forced upward and forward in line with the external auditory meatus and glabella until the dura is pierced. If the dura is entered at this angle there is usually a distance of 2.5 to 3.0 c.m. between the dura and the medulla. It is good practice to aim a little higher than the external auditory meatus and if the needle strikes the occiput to depress just enough to pass the dura at its uppermost attachment to the foramen magnum. At the needle's entrance the sudden 'give' is felt as in lumbar puncture."

Just as the cisterna puncture has been a decided help in the treatment of the acute stage of the disease, so also has lumbar and cisterna drainage been helpful during the convalescent stage. Patients not infrequently, during convalescence, develop within two or three days of the last injection of serum symptoms of increased intracranial pressure, as shown by headaches, vomiting, occasionally fever and irritability. Lumbar puncture in these patients at this time gives clear fluid under increased pressure and it is not uncommon during such drainage for the patient to be instantly relieved of his headache.

A relapse of this disease may occur in which the patient shows the same picture as the one just described for increased intracranial pressure during the convalescent stage, except that the temperature is higher, the vomiting and irritability more marked, the white blood cell count and spinal fluid cell count again increased and Kernig and Brudzinski more pronounced. Whenever a patient presumably convalescing has headache, nausea or vomiting, sudden elevation of temperature and stiffness of the neck, the symptoms are more often due to a relapse than merely to an increased quantity of fluid. Should the spinal fluid appear turbid on puncture under these conditions, antimeningococcic serum must be given intraspinally as before, but because of the danger of an anaphylactic reaction *not* intravenously except in desensitizing doses. Such relapses were observed seven times in our series. Each case again developed a turbid spinal fluid after it once had been clear and there was a reappearance of meningococci in the spinal fliud. Five of these patients eventually recovered after having one or two relapses each; one died with a complicating pneumonia, and one other went thru

four distinct relapses with recovery so far as symptoms and laboratory findings were concerned but later died at home, the cause being known. Although text books speak of a *relapsing type* of this disease, it seems a plausible explanation to say that somewhere along the cord or over the surface of the brain a small walled-off pocket harbors a few organisms and later, as a result of increased activity of the patient or further increase in the number of organisms, the pocket ruptures setting free meningococci into the spinal fluid.

In addition to the relapses which occasionally occur, there are at times certain more or less permanent residual injuries in individuals recovering from this disease. The most frequent of these in our cases was deafness. Deafness occurred twelve times bilaterally and once unilaterally. There were, in addition, four instances of ocular muscle paralysis; one optic atrophy with blindness and hydrocephalus in an infant; one hemiplegia; one atrophy of the deltoid muscle; one slight speech defect. So far as we have been able to follow up these cases, the injuries are still present and most likely permanent. In another infant hydrocephalus followed the actue stage of the illnes but apparently recovered after three months following repeated spinal drainage.

Of the 142 patients recovering, 21 showed the residual injuries enumerated, a total of 15%. The evidence of complications and residuals in the earlier series is not known because of incomplete records.

Before comparing the results obtained in the two series, it may be well to review the methods of treatment used.

The 1916-18 series received serum intraspinally only and at 24-hour intervals. With the exception of ventricular puncture in four patients, all of whom eventually died, the serum was administered by puncture at the lumbar level. If, as happened occasionally, lumbar puncture was unsuccessful, no serum was given.

The 1926-28 series is divided into groups "A" and "B" because of slight variation in treatment. Group "B" comprises 75 consecutive cases following immediately after group "A."

Group "A" received serum intraspinally and intravenously at 12-hour intervals for 3 or 4 doses, after which serum intraspinally at approximately 24-hour intervals. Moreover, serum was injected into the cisterna magna when attempts to give it by the lumbar route were unsuccessful.

Group "B" was treated as was group "A" except that these patients received about 50% more serum intraspinally in a proportionately greater number of injections. It was purely a coincidence that groups "A" and "B" received exactly the same amount of serum intravenously.

The average amount of serum given intraspinally in the 1916-18 series was 111 cc and in the 1926-28 series 137 cc. The later series received, in addition, 52 cc of serum intravenously and in this series serum was administered 117 times into the cisterna magna when the lumbar route was blocked.

RESULTS OF TREATMENT

1916-18	162 cases	89 deaths	Mortality 55%
1926-28—"A"	126 cases	38 deaths	Mortality 30%
"B"	75 cases	21 deaths	Mortality 28%
Total "A", "B"	201 cases	59 deaths	Mortality 29.3%

As shown in Table 1, the 1916-18 series and group "A" of the 1926-28 series received approximately the same number of injections of serum intraspinally and almost the same amount of serum by that route, although in group "A" some of the serum was administered into the cisterna magna. Group "A" received serum intravenously also. The mortality was reduced from 55% in the first instance to 30% in the second.

TABLE I

	1916-18	1926-28 A	1926-28 B	Total 1926-28 A & B
Average Number of Lumbar Punctures in Patients Recovering	5.6	5.5	8.8	6.7
Total Number of Cisternal Punctures	0.	102.	38.	140.
Total Number of Ventricular Punctures	17.	4.	0.	4.
Average Amount of Serum Intravenously	0.	52. cc	52. cc	52. cc
Average Amount of Serum Intraspinally	111. cc	116. cc	173. cc	137. cc
Number of Simple Drainages	46.	121.	67.	188.
Number of Cases	162.	126.	75.	201.
Mortality	55%	30%	28%	29.3%

The greater total quantity of serum and the larger number of injections intraspinally in group "B" (Table 1), other factors being the same, failed to lower the mortality appreciably below that of group "A" (Table III). This would suggest the use of larger quantities of serum intravenously as the next step in treatment, which is in keeping with Herrick's' experience, wherein he found the lowest mortality in those patients receiving considerably more serum intravenously than we have used.

TABLE II

RELATION OF MORTALITY AND AGE OF PATIENT

Age Group	1916-18 Cases	Deaths	Mortality	
Under 1 yr.	14	11	80%	
1 to 3 yrs.	12	5	42%	
3 to 5 yrs.	13	4	31%	
5 to 10 yrs.	22	3	14%	1st Decade
10 to 20 yrs.	25	8	32%	61 Cases
20 to 30 yrs.	30	20	66%	23 Deaths
30 to 40 yrs.	22	18	80%	38%
40 to 50 yrs.	12	9	75%	
Over 50 yrs	10	10	100%	
	1926-28			
Under 1 yr.	9	1	11%	
1 to 3 yrs.	17	5	30%	
3 to 5 yrs.	14	2	14%	
5 to 10 yrs.	41	8	20%	1st Decade
10 to 20 yrs.	59	13	22%	80 Cases
20 to 30 yrs.	32	13	41%	16 Deaths
30 to 40 yrs.	11	4	36%	20%
40 to 50 yrs.	9	6	66%	
Over 50 yrs.	9	6	66%	

The relation of mortality to the age of the patient is shown in Table II and is self-explanatory. It may be well, however, to mention in our later series the mortality rate in early life was lower than that generally given. The average mortality for the first decade approaches closely that of the second decade, after which it mounts suprisingly.

TABLE III

GROSS MORTALITY TABLE

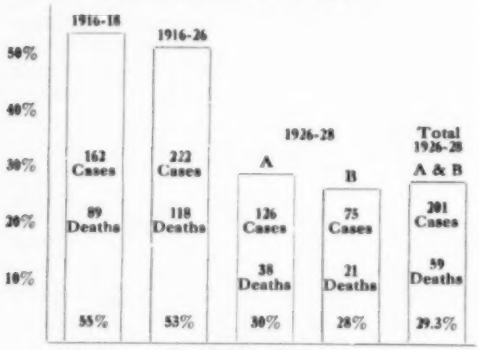

TABLE IV

CORRECTED MORTALITY TABLE

(Omitting patients who died within 48 hrs. of admission to the hospital)

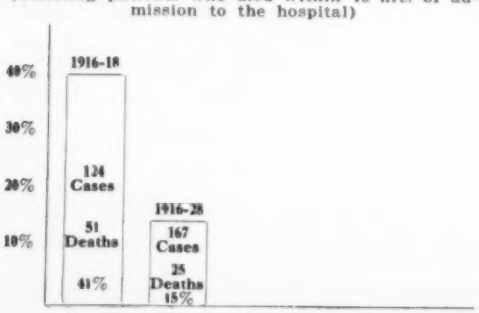

Table III shows a lowering of the general mortality rate in the two series of cases from 55% in the first to 29.3% in the second. A more striking reduction in mortality occurs, however, when we consider the patients surviving at the end of 48 hours after admission (Table IV). Of the 89 deaths in the first series, 38 occurred within the first 48 hours after hospitalization and 51 later. Of the 59 deaths in the second series, 34 died within 48 hours after admission to the hospital, and 25 died after that interval. Eliminating, then, deaths occurring within 48 hours of admission the mortality in the first series would be 41% and in the second only 15%. It seems evident that this reduction in mortality is due to the more intensive treatment which the recent series received within the first 48 hours after hospitalization; namely, serum intraspinally at 12-hour intervals instead of 24-hour intervals, and several injections of serum intravenously. It may be suggested that the lower mortality after 10 years might be due to a more potent serum. Undoubtedly there has been gradual improvement in the serum during this ten-year period, but the combined mortality rate from 1916 to 1926, inclusive, is in excess of 50% and it seems significant that the abrupt drop to 29% came in 1927 coincident with the more intensive treatment.

CONCLUSIONS

1. The mortality rate in meningococcic meningitis, at the Isolation Hospital, St. Louis, has been reduced from 55% to 29.3%.

2. The most striking reduction in mortality is in those patients surviving the first 48 hours after hospitalization, the rate being as low as 15% in the later series.

3. The lowering of mortality was coincident with the employment of a more intensive method of treatment, namely, shorter intervals between intraspinal injections, repeated intravenous injections of serum and the introduction of serum into the cisterna magna when the lumbar route was blocked.

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3. Herrick, Maj. W. W. The Epidemic of Meningitis at Camp Jackson (preliminary report). Jour. A. M.A. 70:227 Jan. 26, 1918. Herrick, Maj. W. W., Early Diagnosis and Intravenous Serum Treatment of Epidemic Cerebrospinal Meningitis.

SOME ASPECTS ON RURAL MEDICAL ECONOMIC SITUATIONS*

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OKEENE

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In the preamble to the Constitution of the United States it promises that this Government establishes justice, equality and promotes the general welfare of its citizens.

We want to consider in this paper some phases of the economic rural problems, many of which have arisen in the last ten years.

First we want to consider it from a social stand point or the stand point of the patient.

Second we want to consider it from the stand point of a country physician.

The facts that make this paper pertinent at this time are certain conditions that have arisen recently. Due to the land getting older, its productiveness has diminished. Drought and hail in this section have caused many recent crop failures. Due to over crowded conditions and keen competition in farming large tracts, the price of real estate has increased. There has been a constant increase in taxation. During the last two years we have seen exceedingly low prices in all farm products, which makes it impossible for the farmers to make a living in many communities. The general depression of the whole country has been reflected very materially in farm life.

In contrast to the last ten years and from 1914 to 1918 these problems did not exist. The farmers then generally were prosperous. Their credit was good anywhere. If they could not pay this year, they could take care of their obligations in full next year. Now times have changed. The farmer can no longer borrow money for any purpose and this presents many economic problems for both the patient and the physician.

The classes of people in rural community may be roughly classified in the following manner:

Class One: The persons in rural towns which have a business that is self supporting and pays small dividends; and farmers that own their land, live on it, and have their places and personal property unencumbered.

Class Two: Persons who have purchased land recently and have it mortgaged for all it's worth; also all their personal property encumbered.

Class Three: Tenant farmers. Everything they have has been purchased on time payments and they have mortgaged all their personal property. Most of the land is farmed by the second and third classes.

Class Four: The common laborers and farm laborers whose incomes are so small that at the best they have just enough to feed and clothe their families, if that. No allowance is made for sickness or other misfortunes which may arise.

Class number one presents no problem whatever because they can get the medical aid they want, when they want it, because they can pay for it.

Class number two presents only a slight problem. With careful management they can pay for medical aid if given time to arrange for it and if circumstances are favorable.

The last two classes present a real problem in case of illness. They are at the mercy of one of three groups; the physician, if he will take care of them without pay (which he can not afford to do), or charitable institutions. There are few of these in the country and they function very poorly. The last responsibility is upon the county.

For the most part in the past the bills of these folks have been the great uncollected part that has been and is still on the books of the country physician and which never has and never will be collected, not even in part. Now let us see whose responsibility it is. The physicians are no more responsible for the care of the indigent sick than any other member of the community. They are not responsible for the conditions that bring about these circumstances. The groceryman is not responsible alone for furnishing bread and groceries to the folk in the community who do not have money to buy food. The drygoods man is not responsible for clothing those in the community who do not have money to buy clothes. The school teacher is not responsible for all the illiteracy in a

*Read before the Garfield County Medical Society Oct. 23, 1930.

community. Thus we see that this class of the rural population, which consists of a very large group, is the problem of the community and society at large to be settled by certain social readjustments and by cooperation with the medical profession. The folk that constitutes this class are all native born American citizens with at least a common education. They are truly American citizens. They are the bread producers of this country. They work long hours and, for the most part, intelligently. They have few school privileges, no medical or health advantages whatever, and no training in hygiene. They are the class of Americans that, if given a chance and a little help, will produce the best type of citizens in this country.

Let us contrast this class with the indigent sick of the cities. The cities spend millions of dollars in a definitely organized Public Health with sufficient organization to put their program where it will reach the class of people it should. Here are many free dispensaries of every type where these patients can receive medical aid, not from questionable sources, but from the best the medical profession can provide. There are numerous charitable organizations in every city which help get these folk in touch with these free clinics and do a definite follow up work supervising the home surroundings to see that this does not hinder the progress of the medical care.

The type of patients that are taken care of in the clinic are 50% foreigners; negroes, Latin Americans and Southern Europeans who never have been or never will be good American citizens but who are here to make money and then leave this country. They are in no way as deserving as the indigent sick of the country.

Let us lay the responsibility to the county commissioners where it belongs. They take an oath to perform the duty of caring for the indigent sick They have the means within their power to take care of the rural situation. They make out the budget of the county expenditures in which there is an estimate of the amount to be used for the indigent sick. This amount is invariably too small and usually runs out in the first thirty days. The physicians, hospitals, and other medicine workers are notified that no money will be available for the indigent sick until the next year. Yet they go ahead paying for roads, courthouse employees, and other business of the county. They know how the country in general is situated financially. Here is where the failure lies. They are elected to build roads. They promise road building before they get into office, in many cases, and spend their time making roads. Their main theme in regard to health or indigent sick is that they will waste no money in this manner. They are absolutely untrained in any social or community problem and the people are not educated to demand better things in preventative or curative medicine for their sick.

Under the present social order it is incumbent upon the county commissioner to decide who is sick and who is not. He must decide who is deserving or not deserving. He has never studied medicine a day, he has not studied the problem of the indigent sick. In cases in which he is in doubt or does not wish to decide, he reminds the sick and the physician that he is a member of a committee of three and that he cannot decide this. Thus he dodges the issue. He hides behind the other two commissioners and says that nothing can be done and that the first Monday of the month he will take it up with the other two commissioners and see what action can be taken. Neither the patient, the community, or the physician can put off this illness until the commissioners have time to meet and consider the merits of the case. In most cases when he wants a road or bridge built he hires an engineer. When he wants a public building constructed he hires an architect, but when it comes to passing upon a medical problem he considers himself thoroughly competent to pass on these conditions and should he decide unfavorably, ask the neighbors to take care of the patients themselves or raise some money among the friends to pay for this service.

Dr. D. L. Bowden, director of rural sanitation in Oklahoma, says. "As to the relation between expenditures for Public Health and road improvement I can give only a rough estimate. It is estimated that there will be between $80,000,000 and $90,000,000 expended for road improvement during the next four years. While at the very outside $1,200,000 would cover the entire expenditures for health work during the same length of time." In other words there will be approximately 85-90 times as much money spent for roads as for health programs.

We boast that we are a progressive, al-

truistic people and that we believe in the preservation of life over property but still we practice the opposite.

The average fee paid by the county commissioners for hospital care is $15.00 a week on cases they approve. In the main no arrangement is made for the indigent sick outside of the hospital. That is at the expense of the country physician. These are taken care of usually in private hospitals at a loss. Dr. Langston, Supt. of University Hospital of Oklahoma City, says that the cost of a patient is about $4.00 a day. Dr. J. H. Stephenson of the Dallas City County Hospital says the cost is about $3.05 per day. Dr. P. E. Williams of the Kansas City General Hospital says the cost per day for the last year has been $3.97 per patient. The private hospital must take this loss on these patients if it gives them the care they need. Again it is putting the burden of the indigent sick at the door of the practitioners and private hospitals.

Public Health says it has the answer to the situation. This may be answered both in the positive and the negative. At the present it has eight full time units in the state. It may touch one-tenth of the population but one-half of these are rural people. It does lead the way to free clinics and preventative medicine. It does not attempt curative medicine. It does not give the indigent sick in the country anything to meet his obligations to care for his curative medicine. It is a good work, necessary, deserving and should be in every rural community. It is much more economy to prevent such diseases as typhoid and diphtheria than to treat them. But this does not meet the need altogether of curative medicine.

The problem of curative medicine with the people in class three or four must be met in one of two ways; first, a full time County Physician on a salary to look after this class of patients; second, an agreement with the physicians already practicing in the county to be paid for the actual expense of the care of this type of patient. It depends on the community as to which plan is the better. It is unfair to a physician to spend his time with patients who never can pay. He loses much of the better class of work if he does this. The public and the commissioners must be educated to the fact that the indigent sick is a social problem and should be taken care of through the regular channels of the county. This type of rural folk in class three and four are really deserving and will make American citizens if given a chance. Money invested in citizenship will surely bring in its returns as much as money invested in public improvements. We have the idea it is right to spend all the money the county has to fix a mud hole in front of a man's house, but none whatever to care for the man within the house who is sick and has no credit, no money, and no way of receiving or paying for medical aid.

Oliver Wendall Holmes said at one time: "The state of medicine is an index of any age of civilization, one of the best, perhaps, by which it can be judged."

In the next portion of this paper let us consider some of the reasons the country people cannot secure the best of medical attention from their physician.

Statistics show that there is a very small percent of recent school graduates after an internship that settle in the country. The trend is all the other way. The causes of the situation are many. In the old days there was not much expense to the practice in the country. Not much of what was collected was spent for overhead. That is no longer true. Today the country physician must have the same expensive equipment that one has in practicing in the city.

Another reason why rural communities find it hard to keep competent medical men, is the absence of good educational facilities for their children.

You say there are many high schools in the rural districts. True but when you have said high schools you have said all that you could say of them. So it is not correct to say he has high school opportunities for his children, let alone that of college or university. All he really has is common school education.

Probably the greatest blow to the country physician is the lack of hospital facilities. To advance properly in the practice of medicine he must have material with which to work. This necessitates a hospital. He then must own, operate, and control a hospital or refer his patient to some one who has one. The former has proved repeatedly to be a financial failure; the latter has many disadvantages. It is very inconvenient to make these long drives to the city. The doctor's practice

must suffer while he is away. He loses touch with his patients when they are in the city hospital. Many times then, the patient ceases to appreciate the work of the country physician. Due to these discouraging features the physician looks for a larger community in which he may serve.

What is the remedy? How can rural people alter these conditions? Some might say the way to correct this evil would be to lower the standards of the rural physician. Admittedly this is no solution to the problem. It would in no way better either, the profession or the medical situation in the country, it would rather retard both.

These are the words of Dr. C. C. Cracraft, Claysville, Pa., and published in the Atlantic Medical Journal Sept. 1923: "Some of the reasons the doctors will not stay in the country are these; the inadequate fees; the bad roads; the hard work; the lack of hospital accommodations, the insufficient educational institutions, but most of all, the lack of appreciation on the part of his patient." Dr. Cracraft goes further to say: "What is the remedy? The country districts have the remedy in their own hands. When they pay a doctor adequately and promptly, build good roads, provide sufficient hospitals, make high schools what they should be, have loyalty to their physician, then and only then will the rural districts be able to secure competent medical men. Let them do these things and the country physician will again appear and there will be no complaint of the dearth of rural physicians."

In conclusion let us consider the two plans suggested for taking care of the indigent sick. The first is that of a full time county physician; the second a plan by which the physician practicing in any part of a county might receive his actual expenses and reasonable pay for his time.

The first plan is a failure for these reasons: The very size of the county makes it impossible for one man to take care of acute cases all over his district. It is only in places where the county seat is 20,000 or more that they are able to afford a full time physician. In a community of this size the physician would spend all of his time in the county seat town or within a radius of less than four miles. It is the rural population that suffers.

The inconvenience of the other plan is this. One physician has said it is easier to bring suit against an individual than to get a commissioner to discuss the question of a sick man. This is why the individual and the physician have been indifferent and as a result the doctors treated the patient and took the loss of his time and money.

When a full time physician is employed he seldom does the surgery necessary. The private practitioner must do this without renumeration. So here again the responsibility comes back to the surgeon in private practice. Therefore we would suggest that if the full time county physician plan is used, that that office be based on merit and ability and not on politics.

There is an adage almost as old as medicine itself. "It is a part of the economics of medicine that the rich must pay for the medical attention of the poor." This theory is extremely popular with the poor but very unpopular with the rich. In the past the physician has made this adjustment. Present day medicine suggests that society should make the adjustment. That the rich may pay for the care of the poor is a social problem and not the problem of the physician.

The author believes that this is the solution. The county health office should be given the authority to pass on the physical condition of the patient, and an assistant be furnished to give the social and financial rating. This is how it would work. A physician sees a patient who never will be able to pay. He notifies the health office. This office immediately investigates and reports the case to the commissioners, with an opinion concerning the physical and financial condition with these reports and that of the resident physician, they would have sufficient facts upon which to decide the merits of the case. This is the plan by which the indigent sick of the rural communities can receive proper medical attention and the physician be treated justly and with equality to all.

SURGICAL TREAMENT OF PULMONARY TUBERCULOSIS

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Aim: The aim is to put diseased lung at absolute rest and to close cavities.

Insofar as quiescence of the diseased

lung is concerned, the surgical procedure does exactly the same thing as sanatorium rest and other time honored means of resting. The surgical means of producing this rest, however is far more efficient than mere rest in bed. The result of surgical procedures is to produce an actual cessation of function in the diseased lung itself.

In a patient who is resting in bed, even though he remains in bed twenty-four hours out of every day, both lungs are always working. One might properly speak of the function of the lungs of such a bed patient as carrying on the basal respiration. In those patients who are suitable for surgical procedures, even the basal respiration is eliminated from the diseased lung. The maximum opportunity for healing, therefore, is given to the diseased lung since the lung is rendered quiescent and is not required to perform work.

Aside from and in addition to this rest, surgical procedures are our most effective means of closing cavities in the lungs. The closure of such cavities is usually necessary for healing. Any patient who has a large cavity in the apex, let us say, can never be considered to be cured as long as this cavity remains open. They may become sputum free or the sputum may be negative for tuberculosis bacilli, but the sword of Damocles hangs over such a patient until his cavity is closed. We have seen, repeatedly, such patients released from sanatoria who were considered as arrested or cured cases because of their being free from temperature, tubercle bacilli, or their general well being. Unfortunately more than 80% of these cases return to the sanatorium within the four years following their discharge. They are, therefore, not only almost certain invalids themselves but they are also a menace to the health of all those with whom they associate.

PROCEDURES

The most firmly established and the most extensively used surgical procedure for the treatment of pulmonary tuberculosis is by closed pneumothorax—moreover this is the least radical procedure. The use of the closed artificial pneumothorax, when properly administered, is well tolerated by the patient. It is flexible in that more can be added as needed or if too much air has been introduced a portion may be withdrawn. At the Barnes Hospital and at Koch Hospital collapse of the lung is always attempted by the use of closed pneumothorax in preference to any other surgical procedure. It is by far the method of choice.

Unfortunately, there are many cases who are suitable for collapse therapy and in whom the use of artificial pneumothorax is impossible because of adhesions between the pleura of the lung and the costal pleura. In such cases a more radical surgical procedure must be employed to bring about a collapse.

Our purpose is to dwell mainly on those surgical measures other than pneumothorax. These are phrenic nerve resection, thoracoplasty and division of the motor nerves to the intercostal muscles.

PHRENICOTOMY

Indications: In the operation of phrenicotomy the nerve supply to half of the diaphragm is destroyed. This produces a paralysis of the diaphragm, and there is a lessening in the respiratory excursions on that side. Welles has shown that respiration is carried on to a considerable degree by means of the diaphragm alone. This is true not only of that portion of the lung which is in the immediate proximity of the diaphragm, namely the bases of the lungs, but respiration even in the apices of the lungs is largely the result of movement of the diaphragm. The widest excursion of the walls of the chest, the diaphragm and rib framework, is low down in the chest. As one approaches the apex of the lungs, the excursion of the ribs in going from full inspiration to full expiration is much less. In an individual whose ribs are tightly fixed, either by bony ankylosis or by resection of the intercostal nerves, respiration is still carried on throughout the entire lung, apex included, through the movements of the diaphragm alone. Paralysis of the diaphragm, therefore, is a logical procedure for the production of rest in the lung.

The details of the operative procedure are worthy of note. This for comparison of magnitude between the procedure of thoracoplasty. The operation for phrenicotomy is described briefly as follows: An incision is made in the neck parallel to and one-half inch above the clavicle at the posterior border of the sternocleidomastoid muscle. The anterior scalenus muscle is exposed and the phrenic nerve picked up as it courses along the anterior surface of the scalenus. It is divided and the dis-

tal end is slowly pulled out of the chest. Often the entire nerve is removed—even the branches which spread out over the diaphragm. This paralyzes the diaphragm.

The operation for phrenicotomy is properly classed as a minor operation. This does not imply that the procedure is without danger. There is an appreciable element of danger to the patient, especially when the entire length of the nerve is drawn out of the chest. Hemmorhage from some deep inaccessible vessel is the most frequently met with calamity. The pleura has been torn—a portion of the costal pleura of the apex of the chest has been removed—and on the left side the thoracic duct has been torn.

In our series of cases of phrenicotomy amounting to a little more than 100, we have had only three unpleasant experiences of this type. None of these have proven fatal—or even serious. In the first instance a girl with an acute tuberculous penumonia (galloping consumption) a phrenicotomy was being done in the usual manner when suddenly the wound became filled with a gush of dark venous blood which welled up from the mediastinum below the level of the clavicle. About 4 cm. of the nerve had been drawn out slowly from the chest before this bleeding started. This segment of nerve was immediately resected and the operation terminated by closure of the wound after waiting for the hemorrhage to cease.

The second and third instances of similar alarming complications at the time of phrenicotomy occurred in two successive cases and on the same day.

Incidentally, I want to mention the result of our phrenicotomy in the girl with an acute tuberculosis pneumonia (or galloping comsumption. She had developed this acute flare up following a long period of partial arrest. For the three weeks preceding the phrenicotomy she had been going down hill fast. She ran a temperature never below 101 and this rose daily to 104. She was sick. The sputum was loaded with tubercle bacilli. In desperation a phrenicotomy was suggested. I did not feel like urging the procedure since I did not expect a great deal of benefit. To my surprise her temperature began to fall. It did not reach a high level on the day of operation and on the third postoperative day the maximum temperature was 99.2 instead of 104 as it had been for nineteen days before the operation.

The benefit was dramatical in type. The temperature fell almost as a crisis in an ordinary pneumococcus pneumonia. The patient is still in the hospital but is making a splendid progress toward recovery. May I be permitted to add that this definitely was not an ordinary pneumonia but was an acute tuberculous affair involving the apex of one lung and this was proven by the typical mottled appearance of the X-ray, the presence of myriads of tubercle bacilli in the sputum.

Dr. Graham has had a similar case with similar dramatic results—so far as I know these two cases are the only ones in whom a phrenicotomy has been done in the face of a violent acute tuberculous process in a lung. They illustrate, in a spectacular manner, the effect of rest in a tuberculous lung.

There are three important considerations for resection of the phrenic nerve or induced paralysis of the half of the diaphragm. (1) The effect is distributed throughout the lung even to the apex. (2) The operation is a minor one and can be tolerated by weak and debilitated patients. (3) The effect is permanent.

There is one definite and consequential difference between artificial pneumothorax and the more radical operative procedures such as phrenicotomy and thoracoplasty. In the latter the compression and loss of function in the diseased lung is permanent. In artificial pneumothorax the effect is temporary.

The question naturally arises, should phrenicotomy and thoracoplasty be used since there is no undoing of their effects. This question is answered by the small percentage of "good" lungs after artificial pneumothorax. These lungs which are riddled with tuberculosis seldom return to the state of serviceable lungs. The patient is usually much better off without them.

THORACOPLASTY

In those cases of unilateral tuberculosis of the lung in which an artificial pneumothorax cannot be made a complete collapse of the chest wall may be indicated. This is done by removal of segments of the first to eleventh ribs inclusive on the affected side. Long segments of each rib are removed. The operation must be done in three or more stages. Beginning at the

level of the transverse process of the spine, the rib is removed subperiosteally for a length extending to the posterior axillary line. This allows the bony framework to sag downward and to move inward toward the mediastinum. The diseased lung is put at complete rest. The improvement in the general condition of the patient is often startling.

INDICATIONS FOR THORACOPLASTY

No brief set of rules can be formulated to make the selection of these cases an easy matter. In general, however, the things for consideration are the resistance which the patient exhibits toward the disease, the distribution of the lesions, the age of the patient, the duration of known symptoms, and the effectiveness of previous treatment.

The best results are obtained in patients who show resistance to the disease. An objective sign of resistance is the formation of fibrous tissue around the lesions as determined by the X-ray. Often this is sufficient to pull the trachea away from midline. Deviation of the trachea, therefore is a sign favorable for thoracoplasty. It indicates that the operation may prove to be worthwhile.

Anther indication of resistance is the narrowing of the intercostal spaces at the site of the lesion. This is nature's own way of accomplishing a thoracoplasty. If the lesion is small, the patient may recover, of course. If the lesion is extensive this attempt at autothoracoplasty should be augmented by removal of the proper segments of ribs in order to permit the collapse of the diseased lung.

I hold that deviation of the trachea due to fibrous tissue about a tuberculous lesion and narrowing of the intercostal spaces which produces a partial collapse of the chest are the patient's prayers for surgical assistance.

THE MOST SUITABLE CASE

Each case requires extensive and careful study both by the internist and by the surgeon. No operation for thoracoplasty should be undertaken upon a 'hunch." Careful consideration of the case should be made by repeated examinations, fluoroscopic and X-ray studies, blood counts, etc. These studies should be carried out by the internist and surgeon working together, both seeing the patient at the same time. This detail is important. We have found that little is accomplished in this respect unless the internist and the surgeon actually meet at the bedside of the patient or in the examining room to exchange and develop their views of the case. In no other type of surgery is such close teamwork so essential.

CONCLUSIONS

1. Surgical collapse of the chest wall may be of great value in the treatment of unilateral pulmonary tuberculosis.

2. Phrenicotomy and thoracoplasty puts the diseased lung at complete and permanent rest.

3. Cases with persistent cavities, or with a unilateral pulmonary tuberculosis which does not respond to the ordinary means of treatment should be considered for surgical collapse.

4. Signs of resistance of the patient should be sought for. They are the presence of much fibrous tissue in the lung as revealed by X-ray, deviation of the trachea, shingling of the ribs, narrowing of the chest wall, the general progress of the disease and a high lymphocyte percentage along with a low stab cell count in the differential.

5. The surgeon and the internist must study each case together before operation.

REPORT OF EXPERIMENTS AS TO THE EFFECT OF SOME DRUGS ON THE BLOOD PICTURE

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Investigations carried out as a result of the recently awakened interest in hemology and hemocytology have revealed the fact that there are many factors, besides definite pathology either in the circulatory system or elsewhere in the body, which result in changes in the blood picture. Since these effects have been found in healthy individuals without symptoms the question arises what part do these factors play in the altered blood pictures we see in persons suffering from conditions in which the blood picture is of diagnostic

importance. If there are factors that thus affect the blood picture then cognizance of them must be taken into account and due allowance made for them in making and interpreting hemological examinations.

There is one phase of this question on which little or nothing has been done in this country and the work done in other countries has been from a toxicological standpoint rather than the conditions likely to be met in the practice of medicine. That is the effect of drugs in therapeutic doses on the blood picture.

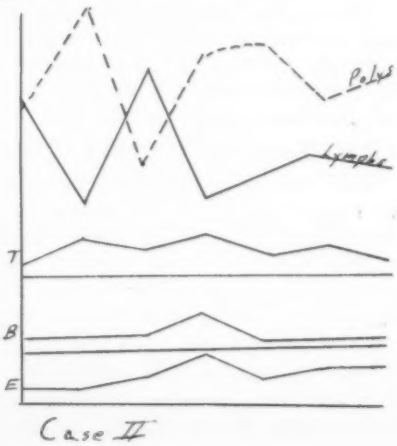
In beginning this work our attention was first called to quinine because of a high and unexplainable eosinophilia found in an incidental blood count on an individual who had been taking quinine as a tonic. The blood picture revealed a white count of twelve thousand five hundred with six per cent eosinophilia. Repeated examinations showed a high white blood cell count, low poly, high leucocyte count, and the high eosinophilia. Counts made on several other patients taking similar treatment showed like conditions. It was found that the tonic in thsse cases contained other substances than quinine; further we had no check on the blood picture before treatment was instituted. So it was decided it would be worth while to take the various ingredients in the tonic separately and study their effect on the blood picture. A further interest in selecting quinine was the frequency of its use as a prophylactic, tonic, and remedial agent.

Heffter in Vol. II of his Handbuch der Experimentalen Pharmacologie has made a careful survey of all work done on the effects of quinine on the blood and blood cell behavior from the original work of Binz in 1868 to 1919. Heffter's summary is as follows: Gremani observed a reduction of erythrocytes after administration of fifteen grain doses of quinine. Krunkel reports a special sensitivity of erythrocytes to quinine at the onset of Blackwater fever. Irisawa found that a moderate but definite leucopenia went parallel with the assimilation of quinine. Roth states that the leucopenia is preceded by a brief leucocytosis which he interpreted as due to the contraction of the spleen. He further says that the leucocytosis was first an increase in lymphocytes followed by an increase in polys. Muriel observed a fall in white cells from ten thousand two hundred thirty to six thousand five hundred forty and from five thousand two hundred seventy to one thousand eight hundred seventy in rabbits subjected to doses of four to six grains of quinine per kilogram of body weight. Trautlein reports changes in morphology of polys under doses of fifteen grains of quinine in normal individuals but not in patients suffering from malaria. Torgau denies that there are any morphological alterations.

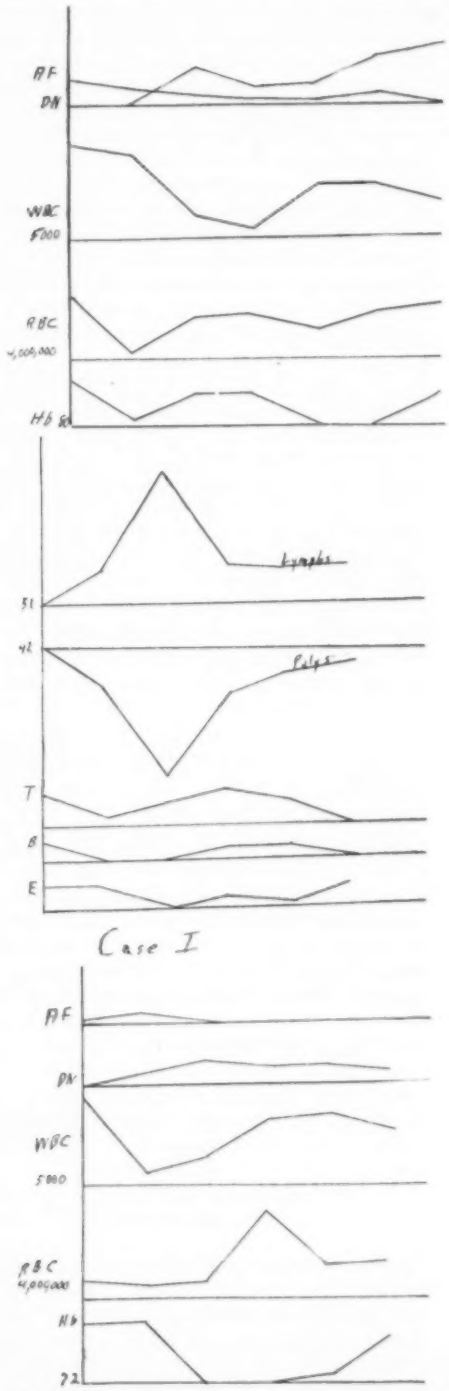
These reports are the basis of all discussions of the effect of quinine on the blood picture. But if you will notice these experiments were on massive single doses, from fifteen grains, to six grains per kilogram of body weight or forty two grains for an average man. Since conditions like these are not apt to be met under ordinary circumstances we decided to approximate the condition such as one might meet in general practice, such as a patient using quinine as a tonic or prophylactic.

We selected individuals free, as far as could be determined, from infections or any demonstrable abnormal blood conditions, in other words healthy adults. None of our subjects had ever had malaria or other diseases likely to leave any effect on the blood or hemopoietic system.

We ran daily complete red and white counts and hemoglobin determinations for several days to establish a normal for each individual. In order to avoid the effects of sleep and alimentary factors the tests were made at three-thirty each afternoon. When the normal was established the subjects took one grain of quinine per day after each examination. The experiments ran over a period of eighteen days. The effects of this dosage is shown by the following graphs.



Case II



From these experiments it appears that quinine in small doses over considerable time does cause variations of the blood picture. At first there is a rather marked disturbance of the red blood cells, polys, and lymphocytes; also the hemoglobin. The first effect is a fall in the number of both red and white cells. This reduction began in about twenty-four to thirty-six hours and attained a maximum in about seven or eight days when there was a gradual return toward a normal. In case I. the hemoglobin did not follow the change in the number of red cells, but in case II. there was a close parallel.

The effect on the white cells was more marked. There was a decided fall in the total count, and a disturbance of the relative percentages. The leucopenia attained its greatest degree in about thirty-six hours then rose toward the normal, but at the close of the eighteen day period had turned down. The variation in the proportion, while marked in both cases, was more individual in particulars. In case I the lymphocytes increased while the polys decreased proportionately. In case II the opposite was the case. But in both cases the percentages again approached normal.

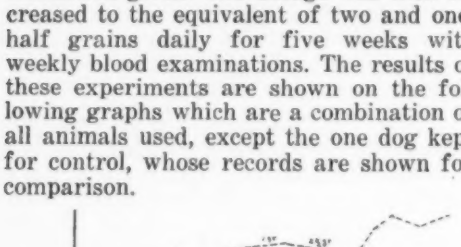
The eosinophiles, basophiles, and transitional cells seemed to be little affected.

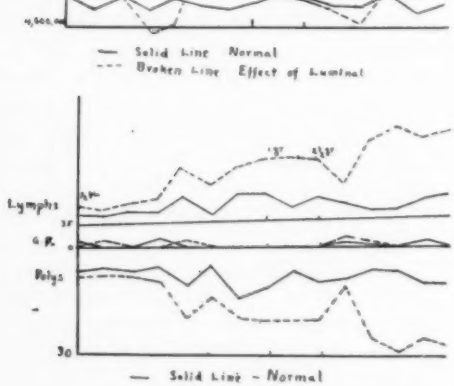
The aberrant, forms such as myelocytes, mast cells, rider cells and others, gradually disappeared. However the so-called degenerated nuclei, of some hemocytologists, gradually increased in both cases.

While the work on quinine was being done by the Department of Pathology a similar set of experiments was carried on by the Department of Pharmacology. Luminal was selected for these experiments because of its wide use as a sedative. So far as could be ascertained no work has ever been done on the effect of luminal on the blood picture. For this reason dogs were used as subjects as a preliminary experiment. However the experiments were designed to be as nearly similar to practical conditions as possible, using animals. Sodium luminal was used because of its greater solubility.

Healthy dogs of nearly equal size and general characteristics were selected. They were kept under the identical conditions for four weeks, a blood examination being made each week to establish a normal for each animal. At the end of this period, one dog was kept as a control and the other dogs were given luminal by mouth. The dosage was proportional per body

weight to that for adult humans. First the subjects were given the equivalent of one-half grain of luminal each day for a period of seven weeks. Their blood was examined each week. The dosage was then increased to the equivalent of one grain each day for two weeks and a weekly examination given. The dosage was then increased to the equivalent of two and one-half grains daily for five weeks with weekly blood examinations. The results of these experiments are shown on the following graphs which are a combination of all animals used, except the one dog kept for control, whose records are shown for comparison.





The red cell count began to fall from the beginning of the administration. This decrease continued to the end of the third week when it reached the lowest point. From this point the count rose abruptly to normal then rather steadily but slowly declined falling faster under increased dosage to reach a new low level at the end of the second week of the maximum dosage. From this point the count again rose some and was slowly going up at the close of the experiment.

The white count seemed to be unaffected until the maximum dosage was given. For the first week there was a sharp decline, then a sudden rise to over twice the normal count, in one dog rising from eight thousand nine hundred to twenty thousand six hundred. The differential count is even more interesting. The percentage of polys, which declined from the beginning, after a rally for the first week of the maximum dosage declined rapidly and was still going down at the close of the experiment. The lymphocyte count increased from the beginning slowly for three weeks then a sudden elevation to a new high level until the administration of the maximum dosage. At this point there was first sharp decline for a week, then a sudden elevation to a new high level higher than any previous point. It will be noticed that the lymphocyte increase is all the more remarkable and is responsible for the high white count at the same time the poly count was going down. At the end of the experiments the dogs were killed and carefully examined for possible infectious processes which might have accounted for the leucocytosis in the last few weeks. None was found, therefore the alteration in the blood picture must have been due to the luminal.

These experiments indicate that the ingestion of drugs does have an effect on the blood picture.

The possible ingestion of drugs should be taken into account in interpreting blood pictures, and may in some cases explain vagaries in blood pictures.

Luminal especially tends to stimulate lymphocytic increase, but seems to have the opposite effect on polys.

Quinine in small doses over an extended period tends to reduce the number of white blood cells affecting both polys and lymphs. What would be the effect of larger doses remains to be found out by subsequent experiments.

THE RATIONAL TREATMENT OF CARCINOMA OF THE CERVIX UTERI*

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Numerous remedies have been suggested for the cure of cancer. The only two methods of treatment that have given favorable results, on careful investigation, have been surgery and radiotherapy, both local therapeutic measures and both of relative youth.

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In the treatment of cancer of the uterine cervix there is still some uncertainty in the minds of many physicians as to the relative merits of surgery and radium. This is not difficult to understand when we realize that in this country as well as abroad there have been two schools of opinion. One was the surgical treatment group, largely composed of surgeons without an adequate knowledge of radiotherapy; and the other was the radiotherapy group, largely composed of roentgenologists without an adequate knowledge of the surgical aspect.

The rational value of either method or combination of methods will depend upon what effect it has upon the anatomy and pathology of the local growth as well as upon the body organism. The merits of each must be judged by the end results and by the amount of comfort afforded the patients. The success of either will depend upon early diagnosis of the disease.

The uterus lends itself poorly to the radical surgery recognized as necessary in dealing with cancer. For example, in operating on a cancer of the breast the removal of the anatomically related glands is considered an indispensable part of the operation. In the ordinary complete hysterectomy the uterus, and a small portion of the vagina and parametrium are removed, but because of the intimate relation with the ureters, urinary bladder and rectum, radical removal, together with lymphatics and related lymph nodes, is not possible without doing an extensive operation with mobilization of the ureters and removal of the glands about the promontory of the sacrum, such as devised and employed by the Wertheim School. It cannot be compared with the ease and safety with which a radical mastectomy can be done. In good clinics where the Wertheim operation is employed wherever possible and in large numbers the immediate operative mortality is not claimed by any to be lower than 10%, and it is universally admitted that in the first hundred operations performed by an individual this figure is raised to lie between 15 and 20 per cent. We must also mention the discomfort of many survivals because the incidence of urinary fistulae runs between 8 and 10 per cent, and an occasional fecal fistulae is admitted by the advocates of this operation.

The spread of carcinoma of the cervix is by the lymphatic system and by direct extension.

Oscar Frankl of Vienna demonstrates extremely well the lymphatic drainage from the cervix. He quotes Shroeder, who made several thousand microscopic sections to prove the location of a small lymphatic node just lateral to the cervix at the level of the entrance of the uterine artery. This he aptly terms the first station of defense. The paravaginal and paracervical tissue is filled with lymphatics which drain these areas. The eventual drainage is to the hypogastric and iliac glands in the region of the sacral promontory, the intermesenteric glands and coeliac glands. One who has seen any considerable amount of autopsy material will realize that any one of the node groups may be involved in metastatic carcinoma of the cervix. What I particularly wish to point out is the fact that most carcinomata of the cervix invade this first station gland and the lymphatics of the paracervical tissue, and proper treatment must not only include local removal or therapy to the cervix itself, but to the vaginal vaults and a consideration of the glands about the promontory of the sacrum.

The direct extension growth of carcinoma of the cervix naturally invades the surrounding tissues which include the adjacent vaginal wall, broad ligament, the rectum and bladder. Strangely there are few instances of invasion of the uterine cavity. Obviously, proper treatment must include the removal or radiation of all invaded tissues.

It is clear from the cursory view of the anatomy of the pelvis and the method of spread that surgery is inadequate in complete removal of carcinomata of the cervix invading the bladder or rectal wall. It was natural, therefore, before the first use of radium, only eighteen years ago, that the clinical classification of carcinomata of the cervix was limited to those that were operable and those that were inoperable Even with the rapid strides made in the use of radium, this is still the basis for the classification in Europe and in many parts of America, and produces great confusion in the attempted statistical comparison of the end results of surgery and radiotherapy. There are certain to be differences of opinion as to the operability or inoperability in different clinics and among different men of the same clinic. The only com-

monly accepted criterion for inoperability is invasion of the surrounding tissue to such an extent that surgical removal of the entire carcinomatous process cannot be accomplished. In clinics in which operation is done where possible an average of 50% of the cases seen fall in this group. Victor Bonney of London reports an operability rate of 63%. Surgery in this inoperable group is clearly contraindicated, and all accept radiotherapy as the rational procedure. The object is naturally to so place radium and fire X-rays as to destroy all deposits. But even where only palliative doses are used the reduction in bleeding, the disappearance of the foul discharge and the general mental outlook of the patient are very valuable.

Since the advent of radium it is in the so called operable group that much discussion has arisen concerning the choice between radium and surgery. It had already been firmly established that surgery was rational and effective only when employed in a radical way and the regional glands removed.

It is likewise quite clear now that radiotherapy is only effective when sufficient radium in proper location and with proper screening is combined with deep X-ray therapy to cause the death of all the cancer cells in the original growth, its extension and lymphatic metastases.

With this in mind we may consider the additional classification of the socalled operable group which has been used for the comparison of the various methods. Early or group I includes those cases in which the growth is clinically limited to the cervix. Borderline or group II. includes those where there is invasion beyond the cervix. We must also consider those cases in the operable group where there is regional gland involvement and those in which there is no involvement.

It is relatively easy to make the first classification of a given number of patients, i. e., those cases in which the carcinoma is clinically limited to the cervix and those in which it extends beyond it into the vaginal fornices and the parametrial tissue close to the cervix.

Looking at the question of a choice between surgery and radium, it would seem that the group I cases offered the logical condition in which surgery could be best used. Statistics show that this is partially true, but we find that there is no standardization of method of classification and the figures are confusing. For example, Bonney operated on 265 cases or 63% of cases seen by him with a relative cure rate of 39.6%. Heyman in Stockholm radiated 186 cases of what he classified as operable class 1 and 2 cases, or 39% of cases seen by him with a relative cure rate of 40.8%. We see that the individual factor of judging a single case and a consideration of the kind of patients applying for treatment makes for great confusion. Healy at the Memorial Hospital in New York states that his early cases average not over 10 or 12% (12 per cent from 1918 to 1925), and that from experience before the use of radium he judges 35% of these to have regional gland involvement. But it is impossible to accurately compare results of surgery with radiotherapy because it cannot be ascertained without pathological material whether there are metastatic deposits in the pelvis or not.

Considering the treatment of these early cases from the standpoint of the effectiveness of radiation, it would seem clear that it would be here if anywhere that our results would be most encouraging. Even were it more logical to employ surgery alone in the treatment of this early group, there are two important reasons why it should not be chosen in preference to radiotherapy. Firstly, it is not possible before operation to determine that there is no involvement of the regional lymph nodes. Secondly, the surgeon who did the radical surgery necessary only in this group of carcinoma of the cervix, would not be able to reduce his immediate operative mortality below 15 to 20 per cent.

To study the question of regional gland involvement alone is even more difficult because before operation determination of involvement is influenced by the physical situation of the glands which makes accurate palpation impossible in the operable group, we are forced to study the surgical pathology material such as is furnished by the report last year of Victor Bonney of London. Statistics are wanting in this country because of the relatively few operations done for carcinoma of the cervix. Bonney has done a classical Wertheim operation with removal of all regional glands on 63% of the carcinomata of the cervix he has seen. He found 40% of these to have regional gland involvement. Bonney points out that if one would

roughly consider that the same rate for gland involvement existed in all cases in all clinics, the latest figures from Stockholm would show by comparison that radium offers a higher cure rate than does surgery in gland uninvolved cases and a less high one in the cases in which the glands are involved.

Though this can be deduced from the statistics between radium and surgical clinics, it is only on a hypothetical basis due to the fact that it is impossible without a pathological specimen to ascertain which cases have regional gland involvement. The surgical group has maintained from the outset that radiotherapy did not reach regional glands, and therein lay the greatest advantage of surgery. For example, Bonney in his most recent report on this subject contends that his relative five year cure rate for no gland involvement is 30.9% of 252 cases treated with radical surgery, and 37.8% of 280 cases treated with radium at Stockholm. With gland involvement Bonney assumes 16% five year cures out of 169 cases, but has allotted all of Heyman's cures to the uninvolved gland group and allows no cures from the gland involved group. He concludes that, "If there were no such thing as gland involvement radium would give better results than surgery."

The case with no involvement is the very type in which surgery would seem rational because we appreciate the extreme difficulty of proper surgical treatment of the drainage lymphatic system of the uterus. If the advocates of radical surgery will thus concede that radiotherapy gives better end results in cases in which there is no gland involvement—and we have shown that this is the logical instance in which surgery is rational—it is obvious we have a decided argument in favor of radiotherapy in early group 1 cases without gland involvement, as well as in all others. The borderline cases are more apt to have gland involvement and their extension and metastases, together with the complicity of the pelvic anatomy, makes surgery from a rational point of view bow to radiotherapy.

Early in this paper we adopted the premise that the merits of either method of therapy, or a combination of them, depended upon the end results, together with the comfort of the patient. The only proper comparison of end results is the actual percentage of patients seen who are still alive a definite length of time after the first visit. Bonney gives his as 25%, and Heyman of Stockholm as 22.7%. However, it cannot be forgotten that each of these men is removing or radiating not only the local growth, but the regional lymphatic system in a radical manner. These figures differ by only 2.3% in favor of surgery. I believe the higher proportion of advanced carcinoma seen in a clinic known for radiotherapy will more than account for this difference.

In addition, surgery has little more to offer and radiotherapy is yet in its infancy, and we have a right to expect improved results from its use.

Another point of consideration is the fact that a large share of the deaths under surgical management are from immediate operative mortality. I have heard it said that by comparison it was immaterial whether the patient died from operation, primary growth, or secondary recurrences. I do not believe many men will agree that the prolonged life and minimum of pain is to be so lightly set aside.

For the reasons stated, I am convinced in my own mind that radiotherapy is the best method we have today for treating all types and groups of carcinoma of the cervix. What the future holds with such possibilities as surgical removal of the glands about the promontory of the sacrum, radiation of the cervix and vaginal vaults, and deep X-ray therapy of the pelvis afterward, no one is prepared to say. It is clear that to obtain the best end results radiation in large, properly screened, properly placed dosages of the primary growth and the entire regional lympathic system is not only desirable but imperative.

In this paper we have only been concerned with proper methods of treatment. We have assumed that careful scientific procedures must be employed in either of two large, grossly different therapeutic fields. Thus, while the technique of radiotherapy has not been entered, it is essential that a careful study of the pathology, anatomy and physiology of each patient be made, and the details of the technique minutely considered and rigidly applied. Inadequate, improper or careless use of radium, especially in untrained hands, will of necessity give poor results and discour-

age those who have been influenced to have it used on their patients and friends.

CONCLUSIONS

1. A combination of radium and X-ray therapy seems to be the most efficient form of treatment at present and we have a right to expect even better results from its use.

2. When radiotherapy is used, not only the local primary growth but the entire regional lymphatic drainage system must be treated with radiation of the vaginal vaults and X-ray of the glands about the promontory of the sacrum.

3. This must be in sufficient dosage and properly screened and properly placed to afford enough radiation in each part of the area considered to destroy all the offending growth.

4. In advanced cases only radium and X-ray therapy are to be considered.

5. If surgery is used it is imperative that it be radical as in the surgical treatment of other cancers.

6. Early carcinomata of the cervix are rationally treated with radical surgery, but if radiation is ever effective it should be in this type of case. End results have not proved radiation inferior.

7. Unfortunately only a minor percentage of the cases seen will survive because of the difficulties incident to an early diagnosis.

8. It is possible that in the future we may use radium in the vagina and cervix, remove the glands by operation and X-ray the pelvis afterward.

9. The prolongation of life and comfort of the patient is not irrelevant but vital in deciding which is the superior method of therapy.

THE MODIFICATION OF POWDERED MILKS GOVERNED BY THE SAME RULES AS COW'S MILK

When physicians are confronted with undependable fresh milk supplies in feeding infants, it is well to consider the use of reliable powdered whole milks such as Mead's or the well-known Klim brand. Such milk is safe, of standard composition, and is easily reliquefied.

Under these conditions, Dextri-Maltose in the physician's carbohydrate of choice just as it is when fresh cow's milk is employed.

The best method to follow is first to restore the powdered milk in the proportion of one ounce of milk to seven ounces of water, and then to proceed building up the formula as usual.

RECURRENT MENINGITIS WITHIN A PERIOD OF EIGHT YEARS

I. P. Bronstein, Chicago (Journal A. M. A., June 22, 1929), reports an unusual case of recurrent meningitis. The original attack was associated with a nasal operation. The recurrent attacks took place four and six months later, the final attack after a lapse of seven years. The association with a nasal discharge was noted on the second and third attacks, whereas in the fourth attack the nasal discharge was absent but influenza was present. The causative organisms varied, but at no time was the identity of meningococci definitely established.

SUPPRESS NARCOTIC ABUSE

With the approval of the Board of Trustees of the American Medical Association, I write to urge the active co-operation of the Oklahoma State Medical Association with the Federal Commissioner of Narcotics and the proper officers of your own State in their efforts to suppress the abuse of narcotic drugs.

It was solely through the efforts of the American Medical Association that Congress recently authorized the co-operation between the Federal Government and the government of the several States, by providing:

"That the Secretary of the Treasury shall cooperate with the several states in the suppression of the abuse of narcotic drugs in their respective jurisdictions, and to that end he is authorized (1) to cooperate in the drafting of such legislation as may be needed, if any, to effect the end named, and (2) to arrange for the exchange of information concerning the use and abuse of narcotic drugs in said states and for cooperation in the institution and prosecution of cases in the courts of the United States and before the licensing boards and courts of the several states. The secretary of the treasury is hereby authorized to make such regulations as may be necessary to carry this section into effect."

An act to create in the Treasury Department a Bureau of Narcotics, and for other purposes, approved June 14, 1930, Section 8.

The influence of the Oklahoma State Medical Association in promoting the establishment of effective cooperation as contemplated by the act will go a long way, it is believed, toward determining whether the legislation that the American Medical Association proposed and sponsored will or will not be successful.

Wm. C. Woodward. Director

PHYSIOLOGY OF ATELECTASIS

Yandell Henderson, New Haven, Conn. (Journal A. M. A., July 13, 1929). asserts that closure of a bronchus or bronchioles is a determining factor in the development of pneumonia. The deep breathing induced by carbon dioxide has already proved capable of preventing such closure and keeping the lungs open. Inhalation of carbon dioxide thus offers a prophylaxis of probable value in the early stages of pneumonic infection. It may be of therapeutic value even in advanced stages of the disease.

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Articles sent this Journal for publication and all those read at the annual meetings of the State Association are the sole property of this Journal. The Journal relies on each individual contributor's strict adherence to this well-known rule of medical journalism. In the event an article sent this Journal for publication is published before appearance in the Journal, the manuscript will be returned to the writer.

Failure to receive The Journal should call for immediate notification of the editor, Barnes Building, Muskogee, Oklahoma.

Local news of possible interest to the medical profession, notes on removals, changes in address, births, deaths and weddings will be gratefully received.

Advertising of articles, drugs or compounds unapproved by the Council on Pharmacy of the A. M. A., will not be accepted.

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EDITORIAL

THE ANNUAL MEETING DATES

At a recent meeting of the Council Committee the following action with reference to the next annual meeting, at Oklahoma City, was taken.

The dates, May 11, 12, 13, 1931, were selected. It has been tentatively decided that all meetings of Sections, housing of exhibits, President's reception and dance, except meetings of the Council and possibly one meeting of the House of Delegates, will be held in the Shrine Temple.

The Skirvin Hotel has been tentatively selected as hotel headquarters. It was also decided that several prominent men from different lines of work, nationally and internationally known as authorities, will be invited to appear once or more before general meetings of the Association.

Two of the mornings of the meeting will be devoted in entirety to general meetings, dry clinics, and probably the showing of moving pictures, if satisfactory films can be secured.

OKLAHOMA CITY AS A CLINIC CENTER

Medical meetings at Oklahoma City are always well attended. The outstanding ability of its medical profession, the attractiveness of the city itself, due to its many social advantages and the fact that it is the State's medical and hospital center goes far toward assuring success of such meetings. The November meeting, known as the Annual Fall Clinics was no exception to the rule. Notwithstanding that it was not so widely advertised or over a long period of time it was eminently successful. The various clinics were made attractive by the importation of high class specialists from many lines of work and the various divisions of the work was in the hands of local men who conducted them with great ability. All the meetings were held at one place, the University Medical School auditorium.

More than 450 people attended the banquet at the Oklahoma City Club, while the smoker at the Skirvin Hotel, given upon the second night of the meeting, was a huge success.

It is the present plan of the sponsors of this clinic that it will hereafter be an annual event in Oklahoma medicine. They are to be congratulated upon their progressiveness and may be assured in advance that their meetings will grow in importance and value to the State's profession.

ANTIVIVISECTION PROBLEMS

Medical men, when first their attention is called to the propaganda of the *antivivisectionist* and the inexcusable hampering of the orderly advance in medicine and surgery brought about by such propagan-

da, are appalled, irritated and indignant. In England, a small, vociferous, wealthy and often untruthful and misguided minority succeed in seriously hampering the progress of medicine by securing the enactment of adverse legislation. For many years sporadic efforts, principally centering in Washington—as they believed the national government to be the best entering wedge—have been made by the *antivivisectionist* to secure legislation which if enacted, would at once begin to do an unbelievable amount of damage to the progress of medicine, as well as an unknown, incalculable amount of harm to humanity. People are very thoughtless, thoughtless of their own interests often. Only those who are students of scientific work will appreciate just what interference with experimental medicine means to the physician and the layman in all walks of life. The role which experimental medicine, coupled with necessary animal experimentation has played in the discovery of the cause, the prevention, treatment and control of disease, both in men and domestic animals is well enough known to the student, but is given no attention by the layman and very little by the physician.

There is now pending in the National Congress a piece of most dangerous and pernicious legislation, whose enactment would seriously hamper the study of diseases, affecting domestic animals as well as those of man. It is to be hoped that no member of the Oklahoma delegation in Congress will so far forget the brilliant achievements in preventive medicine as to be found allied with these propagandists. But unless his attention is specifically called to the dangers, he can easily be led in the wrong direction. The medical profession agrees at once that inhumane and unnecessarily cruel experimentation is to be deprecated and is inexcusable on the part of any experimentor and it is unbelievable that a scientist or student conducting experiments would permit an animal to unnecessarily suffer. But should such isolated cases occur the *antivivisectionist* avidly seizes upon that as the horrible example and proceeds to let down a barrage of criticism against *all experiments*. Those protestants seem to care not for the cruel methods by which the furs which keep them warm are secured, by the punishment often inflicted to secure their food, but they are greatly concerned over some worthless cur whose sacrifice may eventually save the lives of children or worthwhile animals.

A more severe blow to the advance of American medicine, than the passage of this foolish legislation can hardly be conceived.

It should be remembered that in many instances our critics are themselves misled, so far as they are concerned, they are acting in good faith, they are not dishonest, merely misguided, misinformed, often hysterical reformers. In the past a great many hearings have been held and from time to time in Washington, great leaders of the medical profession have appeared to controvert the senseless claims of the propagandists and one defeat more or less means nothing to them. They simply return more rabid and misrepresentative than ever.

Charles W. Eliot has well said "The humanity which would prevent human suffering is a deeper and truer humanity than the humanity which would save pain or death to animals," and this should be often borne in mind by the physician. Just think for a moment what it would mean to the medical profession to be deprived of the use of the rabbit and guinea pig in the diagnosis and treatment of diseases, but just why one should be so concerned over the interest of a dog as against those of a child is beyond comprehension. The physician should remember the following diseases, all of which have been affected more or less and in various ways, directly and indirectly by some type or types of animal experimentation: cancer, rabies, tuberculosis, disease of children, syphilis, cholera, dysentery, typhoid, plague, diphtheria as well as other diseases, Animal experimentation has been absolutely necessary in the past to determine the effects of drugs, the phenomena of circulation, the problems of obstetrical pathology and countless sources of improved diagnosis of diseases.

Yandell Henderson, Journal of the American Medical Association, December 1, 1928, page 1737, pointed out the probable steps through which this dangerous legislation would be brought about. Due to the apathy of the medical profession it has been making decided progress.

It should not be forgotten that it is not rare to have a physician himself to undergo various forms of experimentation. It is not within our memory that two famous

Japanese physicians died as martyrs to the cause of science during their investigation which definitely settled the causative factor of the plague. It should not be forgotten that in Cuba when the determination of the cause of yellow fever hung in the balance two heroic American physicians lost their lives.

The writer is personally aware of the fact that two decades before the Kansas mountebank, Brinkley, was using his fake gland transplantations, a brave Chicago surgeon transplanted human glands into himself, and before he ever used them on any human. No true physician ever asks a patient to undergo any system of treatment that he would not himself undergo.

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Editorial Notes—Personal and General

DR. A. L. DAVENPORT, Holdenville, sustained two broken ribs and bruises, and Dr. W. E. Floyd, Holdenville, received minor injuries in a car collision in Shawnee, in November.

GARVIN County Medical Society met November 19th, in the office of Dr. W. P. Greening. Their regular program consisted of a resume of the year's work done in the society.

DOCTORS LEROY LONG, LEROY D. LONG, WENDELL LONG, AND BERT F. KELTZ announce the organization of the Leroy Long Clinic, 714 Medical Arts Building, Oklahoma City.

WOODWARD County Medical Society met November 11th, when an educational film from the extension division of the University of Oklahoma was shown. A round table discussion concluded the program. Luncheon was served at the Masonic Hall.

THE AMERICAN COLLEGE OF SURGEONS, meeting in Philadelphia in October, conveyed Fellowship degrees upon the following Oklahoma physicians: Doctors Charles B. Barker, Guthrie; James E. Harbison, Oklahoma City; Dick Lowery, Oklahoma City; Lehnoir A. McComb, Tulsa; A. Ray Wiley, Tulsa; Leonard Scott Willour, McAlester.

BRYAN County Medical Society met Tuesday, November 18, 1930, for their regular meeting, in the office of Dr. B. B. Coker. Dr. J. S. Fulton, Atoka, Councilor of the State Medical Association, was in attendance, also Dr. Gardner of Atoka. Dr. J. T. Wharton, Durant, read a paper on "Ether Anesthesia." Dr. Fulton read a paper on the subject of organization and accomplishments of the regular medical profession.

MUSKOGEE County Medical Society, November 16th, heard Dr. Rex Boland, Oklahoma City, on "Features in Diagnosis and Treatment of Syphilis," and Dr. Shade Neely, Muskogee, on "Prostatitis, Non-Venereal."

December 1st, the society had presented Dr. Edward Martin's two-reel film on "Acute Appendicitis," and the film on Anatomy of the Abdominal Wall, from the Northwestern University, which is being circulated to county medical societies through the courtesy of the Petrolagar Company.

DR. O. E. SOMERVILLE, Bartlesville, Medical Director of the Phillips Petroleum Company, was host to many of the medical staff and others November 1st.

Lunch was served at the Hotel Marie, after which the visitors were driven 16 miles west to one of the show places of the United States, the wonderful etablishment, game preserve and resting place of Mr. Phillips. There visiting physicians were shown over a vast estate of thousands of acres of hill land, dotted with large and small lakes, much of the land parked, the remainder protection to hundreds of head of buffalo, elk, Indian cattle and many species of deer collected from various parts of the world. The estate was a wonderful surprise to those who had not the pleasure of visiting it before.

Dinner was served to approximately fifty visitors, in the dining room of the lodge. The amplitude of the meal may be suspected when one is told that steaks from sacred Indian cattle, buffalo, elk and barbecued chickens were the only meats placed before the visitors. They were required to get along with other substances for the rest of the meal. After the meal the problems of "Traumatic Hernia," "Back Strains," and "Traumatic Arthritis," were discussed by Doctors C. O. Von Wedel, Earl D. McBride, Oklahoma City; Pat Fite, E. A. Welch and C. A. Thompson, Muskogee.

The hope was voiced that the meeting might become an annual event, and it was also amended that it be made to last a month. In other words it was a huge success.

Dr. Somerville and Mr. Phillips were the recipients of many good wishes over the occasion.

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DOCTOR ERTON EDWIN POYNOR

Dr. E. E. Poynor, of Westville, died November 11, in Louisville, Ky., while attending the Southern Medical Association. Dr. Poynor had been in ill health for some time.

Dr. Poynor was born in Osage, Arkansas, in 1881. Graduated from the University of Arkansas Medical School in 1904.

He is survived by his wife, two sons and two daughters.

Interment was made in Green Forest, Arkansas.

DERMATOLOGY, X-RAY AND RADIUM THERAPY

Edited by C. P. Bondurant, M.D.
413 Medical Arts Building, Oklahoma City

Treatment of Pruritus Ani and Anal Fissure. W. B. Gabriel, Brit. M. J. 1:1070 (June 15) 1929.

An anesthetic of a 3% solution of anesthesin, with benzyl alcohol 5%, and ether 10% in sterilized olive oil is used as a subcutaneous injection by the author in the treatment of essential pruritus ani. The solution is injected subcutaneously in a fanshaped manner around the anal margin. Sixteen patients were successfully treated in this manner. The average injection was four cc, at one sitting, and the number of injections varied from one to six; one patient received as much as 22 cc of the solution. The author reports three cases of the treatment of rectal fissures. A slight burning was the only complication noticed.

Molluscum Contagiosm and Turkish Baths, C. G. Crowley, M. J. Australia 1:806 (June 15) 1929.

Molluscum Contagiosum is very rarely in Australia; English workers have called attention to the association of it with Turkish baths. This is warranted by a report of three cases seen within two days at Melbourne, a very unusual incidence. Each of the patients had been taking Turkish baths in the same bathing establishment.

Keratosis Punctata. H. C. Semon, Proc. Roy. Soc. Med. 22:349, 1929.

The author describes the case of a woman 45 years of age, a masseuse, who had an abnormal condition of her right hand for over fifteen years. The palm became sore after playing tennis. Groups of little horny plugs slowly formed on the red and rough areas. Their removal with a needle gave some relief, but the thickened ridges at points of flexion often caused lesions which caused disuse of the hand. Lesions were limited to the palm and flexor aspects of the first joints of the fingers and thumb of the right hand. There was general diffuse thickening of the skin in these areas, with chronic hyperemia of a passive type. The thickening was accentuated over points of greatest flexion, and there was a tendency to the production of transverse fissures, appearing not lower than the corneous layer. Small groups of pits the size of a pinhead were scattered over the affected region. The lens revealed minute keratinous plugs within some of the pits. The whole palm was dry and scaly. The studies of Hallopeau and Claisse (Bull. Soc. franc. de dermat et syph., 1891, p. 116, on histologic grounds, assign to it a nevoid origin. Galloway and Adamson described two cases in a husband and his wife (cousins) and demonstrated them with microscopic slides to the Brit. J. Dermat 30:123, 1918); his evidence supports the view still further. Dr. Adamson thought the case one of lichen planus, an impression apparently confirmed by the presence of white patches in the mouth.

Unusual Lichen Planus. H. W. Barber, Proc. Roy. Soc. Med. 22:351, 1929.

The author reports the case of an oval area of cicatricial atrophy of the scalp. The area was completely denuded of hair and red in color from capillary dilatation; on vitropressure the dilated vessels were completely obliterated. This is an interesting case as it is combined with follicular keratoses on the trunk. The latter manifested itself on the buttocks and thighs in follicular lesions similar to lichen spinulosus. In the perineum and on the mucous membranes of the cheeks, typical lichen planus lesions were present. Dr. Graham Little (Brit. J. Dermat. 1915, 183), Dr. Dore (ibid., 295), and Dr. Wallace Beatty and Dr. Speares (ibid., 331), describe the case. It is difficult to avoid the conclusion that some cases, at least, of so-called folliculitis decalvans or pseudopelade are really cases of lichen planus, and that the "lichen spinulosus," described in association with it by several observers is merely the follicular variety of this disease.

Leukosarcoma. D. H. Flashman and S. S. Leopold, Am. J. M. Sc. 177:651 (May) 1929.

The case of a man, aged 60 is reported by the authors; his history revealed that he had a swelling in the right inguinal region for twelve months. A biopsy showed lymphosarcoma, and a roentgenogram revealed a tumor in the pelvis. His blood examinations were negative during the period of about five months in which he was given roentgen treatments. His leucocyte count was normal, until the month following the treatments, when he developed a leukemia. The white blood count rapidly increased to 444,000 cells per cubic millimeter at the time of death, and the differential blood count showed from 90 to 96 per cent small lymphocytes. A primary, invasive lymphosarcoma in the inguinal and retroperitoneal regions was indicated by an autopsy; also an extensive involvement of most of the lymphoid system, liver, spleen and bone-marrow of the right femur and metastic nodules in most of the organs. Different degrees of hyperplasia, or differentiation were represented within the tissues by large lymphoblasts and small lymphocytes with various combinations and intermediate types. The case falls in the group of leukosarcoma, although it appears intermediate between typical lymphosarcoma and lymphatic leukemia, rather than a combination of the latter two.

Local Treatment of Burns. E. Makai, Munchen. med. Wchnsdhr. 76:574 (April 5) 1929.

Makai has used pure kaolin powder or kaolin powder with an admixture of tannin or sime similar drug for the treatment of burns. The powder is sprinkled daily on the burnt surface to a thickness of about 3 or 4 mm, and then covered with some gauze compresses and a thin layer of zinc oxide ointment. The wound secretion is absorbed by the thick layer of powder, and the formation of crusts is prevented by the thin layer of zinc ointment over the gauze. The daily changing of dressing is thereby made painless; the elimination of the necrosed tissues and the epithelization of the burned surface are very rapid. The author states that in a very severe and extensive burn (of the second and third degrees), the patient had a high fever, and a toxic exanthema. With the treatment described above the patient recovered in four weeks with only a small defect in the epithelization of the wound. Makai has used this method successfully for ten years.

Cancer Following Burn. H. Stauffer, Ztschr. Krebsforsch. 28:418 (March 20) 1929.

The author groups the cases of cancer following burns into divisions: instances of cancer developing in a burn itself and cases of cancer developing in the scar of a burn. The former type is rare, but the latter type is very frequent. The author has given summaries of the case reports in all the instances of true burn cancer. He also reports the case of a man 66 years of age, whom he personally observed. Thirty days after a flame burn was received on his cheek, a typical cancroid developed in the noncicatrized burn.

ORTHOPAEDIC SURGERY

Edited by Earl D. McBride, M.D
717 North Robinson Street, Oklahoma City.

The Nature of Arthritis, With Consideration of The Rationale Underlying Some Forms of Physiotherapy Useful in This Disease. Ralph Pemberton. Radiology, XII, 235, March 1929.

Arthritis is the oldest known disease, and afflicted the dinosaurs long before the advent of man. Interest in it is being brought around by the realization that it constitutes one of the great scourges of society. Rapid progress in its treatment began with the recognition of focal infection as a cause. This, however, constitutes only a part of the problem.

Recent study has shown that a fifth of all cases show a decrease in basal metabolism. Metabolism of nitrogen, fats, calcium, phosphorus and uric acid seems normal, but there is a delayed removal from the blood of ingested glucose, which closely parallels arthritis and focal infection. With removal of a causative focal infection and cure of the arthritis, the delayed removal of sugar returns to normal. With the delayed removal of glucose, there is a delayed utilization of oxygen in the smaller vessels, apparently due to a change in circulation, a tendency toward vasoconstriction, with a relative anemia, in some of the tissues. This can, to some extent, be counteracted by vasodilator drugs.

Study of the capillaries of the arthritic shows that these contain less blood than normal, and a more sluggish, interrupted stream. Hypertrophic arthritis has been produced experimentally by interference with cirulation.

It is known that exercise, massage and heat are among the most useful measures in treatment of arthritis. Their benefit probably depends upon their influence on circulation. Exercise has been shown to induce a systemic acidosis, while heat, systematically applied, leads to an alkalosis induced by the loss from the body of acid bodies, chiefly carbonic acid, from overventilation of the lungs. Massage, while partaking somewhat of the nature of exercise, cannot be shown to have any such influence on the acid-base equilibrium as either heat or exercise.

Both heat and exercise increase the circulation and cause a sharp rise in the oxygen percentage saturation of the peripheral blood and an increase in the red-cell count. Massage also increases the red-cell count. Evidently, the effect upon arthritis of exercise, heat and massage is due to their influence on the peripheral circulation.

Polyarthritis: Further Studies on the Effects of Sympathetic Ganglionectomy and Ramisectomy. Leonard G. Rowntree and Alfred W. Adson. J. Am. Med. Assn., XCIII, 179, July 20th, 1929.

In March 1927, a report was made of the early results from lumbar ramisectomy on a case of severe multiple arthritis. On observation in October 1928, there was so much improvement that ganglionectomy was done for relief of symptoms in the upper extremities.

The patient, a young woman, stenographer, had been hopelessly ill for six years with progressive changes in all extremities from arthritis deformans, the joints swollen, contractions present, kin shiny, nails brittle, cold, clammy extremities, bathed in sweat with tenderness and pain on motion. Bilateral ganglionectomy was done in June 1926, with immediate and complete relief of symptoms in both legs. In October 1928, she returned with practically normal function in the lower extremities. The skin was warm and dry, motion free and painless, but some crepitation, particularly in knees, and no appreciable change in roentgenograms before operation and two and one-half years later. During this period of freedom from symptoms in the lower extremities, there had been progressive increase in the involvement throughout the joints of the upper extremities.

In November 1928, a bilateral cervicodorsal ganglionectomy was done, and immediately the hands became warm and dry, the capillary circulation improved, and early relief from pain and stiffness incident to the arthritis followed.

There were some minor complications from this operation, but the general improvement was satisfactory, though there was occasional return of arthritic pains in wrists and elbows four months after operation.

Complications incident to the cervicodorsal operation were Horner's syndrome, tachycardia, elevation of blood pressure, and disturbance to sweating mechanism. Five months after operation, Horner's syndrome persisted, but the blood pressure was normal in all extremities and the patient comfortable and happy.

A Further Contribution to The Knowledge of Birth Palsy. B. Valentin. Ztschr. f. orthop. Chir., Ll., Heft 1, 1929.

Without pathologic material, the determination of the site of the lesion causing palsy of the shoulder girdle is bound to be uncertain at best. The author does not believe that the majority of cases are the result of a faulty birth mechanism as most observers have taken more or less for granted. He maintains that no one theory will explain all the cases. Injuries to the plexus certainly do not occur in many.

He recounts in detail a case in which a male infant was born without known trauma. The infant did not breathe for some time and resuscitation by swinging was resorted to. Four days after birth, the child first began to move the right arm but weakly and the left in a similar fashion. The neurological findings were such that a competent neurologist diagnosed a bilateral plexus injury of the

seventh cervical and first dorsal vertebrae. Twelve weeks after birth the child died, having evidenced all the time signs of some intracranial disturbance. The only relevant maternal history consisted of three injections of typhoid serum during her pregnancy.

Postmortem revealed no injury of either plexus, but an area of degeneration in the lower cervical and upper dorsal gray matter, two to three centimeters long, corresponding to the seventh and eighth cervical vertebrae. This malacic area contained no old blood or hemosiderin containing cells. Glial proliferation was extreme. Other regions of the cord quite distant from the area showed similar gliosis—as in the nucleus arciformis of the medulla oblongata.

The author is inclined to believe the multiple lesions are possibly of infectious origin as similar changes would occur in typhoid, for example. At the time of death, no evidence of old blood were present, yet the possibility of the flexion and extension movements of the vertebral column during resuscitation being at fault cannot be ruled out.

In general, the author feels the traumatic factor in the production of birth palsy has been overestimated, especially in so far as plexus injuries are concerned, and feel the etiology is to be confirmed by pathological check-up if the opinion is to be of any value.

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BOOK REVIEWS

Treatment of Epilepsy. By Fritz B. Talbot, M. D., Clinical Professor of Pediatrics, Harvard University Medical School; Chief of Children's Medical Department, Massachusetts General Hospital. New York, The MacMillan Company, 1930. Price $4.00.

This is a 308 page volume, containing 19 chapters and an extensive reference to the literature. Professor Talbot says that not until 1928 when Lennox and Cobb presented a monograph on epilepsy was the present day conception of teatment outlined. It is his intention that this book on treatment supplement that of Lennox and Cobb. The author places great importance in the use of the Ketogenic diet in the treatment of epilepsy and states that it has been used with success for a sufficiently long time to justify its classification among the important new methods of treatment.

Surgical Clinics of North America. (Issued serially, one number every other month.) Volume 10, number 5. (Pacific Coast Number, October, 1930.) 271 pages with 136 illustrations. Per Clinic year (February 1930 to December 1930.) Paper $12.00; Cloth, $1600. Philadelphia and London.

Physical Diagnosis. By Warren P. Elmer, B. S., M.D., Associate Professor of Clinical Medicine, Washington University, School of Medicine; Assistant Physician to Barnes Hospital; Physician-in-Charge Missouri Pacific Hospital; Consulting Physician to Jewish Hospital, St. Louis, and W. D. Rose, M.D., late Associate Professor of Medicine in the University of Arkansas, Little Rock, Arkansas. With Three Hundred Thirty-seven illustrations. St. Louis, The C. V. Mosby Company. Price $10.00.

Readers will remember that the late Dr. W. D. Rose devoted much of his lifetime to physical diagnosis. Much of the work has been rewritten in this volume, but Dr. Elmer has rearranged the matter so it is now divided into two parts. Part one, The Technic of Physicial Examination and Physical Examination of The Normal Body; Part two, Physical Diagnosis of Diseases of the Respiratory and Circulatory Systems.

Legal Medicine and Toxicology. By Ralph W, Webster, M. D., Ph. D., Late Clinical Professor of Medicine (Medical Jurisprudence) in Rush Medical College, University of Chicago, Chicago, Ill. 862 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $8.50.

This is a volume of twenty-two chapters; it is modern in every respect and naturally enters into many of the legal phases of medicine. Identification of the living and dead, types of death, wounds and injuries in their medico legal aspects, various examinations, composes approximately half of the volume, while the remainder considers the aspects of poisoning of many types.

Text-Book of Gynecology. By Arthur H. Curtis, M.D., Professor and Head of the Department of Obstetrics and Gynecology, Northwestern University Medical School; Chief of the Gynecological Service, Passavant Memorial Hospital, Chicago. 380 pages with 222 original illustrations. Philadelphia and London: W. B. Saunders Company, 1930. Cloth, $5.00.

The author states that his work on Gyrecology received such favorable consideration he felt impelled to write a more complete text upon gynecology. He intends the work to be a simple record of his own experiences. All of the illustrations are original except in four instances they are actual reproductions from the author's personal cases.

The Surgical Clinics of North America. (Issued serially, one number every other month). Volume 10. No. 3. (New York Number, June 1930). Octavo of 265 pages with 123 illustrations. Per Clinic Year, February 1930 to December 1930. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1930.

This is a good issue. Space prohibits mentioning all the articles. Drs. Eugene H. Pool and Roland W. Hipsley present a clinic on "The Effects and Results of Splenectomy in a Variety of Conditions"; these conditions consist of: "Thrombocytopenic Purpura," "Malarial Splenomegaly," "Splenic anemia," "Gaucher's disease," "Von Jaksch's anemia," "Splenic anemia with yellowish-brown inclusion bodies in the spleen."

Dr. Edward Beer considers the use of "Uroselectan as an Intravenous Pyelograph, Ureterograph, and Cystograph Medium (Swick)."

Dr. William Francis Horan, presents "Surgery in Selected Types of Pulmonary Tuberculosis";

Dr. Charles Murray Gratz presents a number of orthopedic conditions, of special interest is that on "Pathologic Fractures";

Drs. William L. Sneed and H. Eugene Reading present "Fractures of the Spine";

Dr. Ira Cohen presents "The Role of Syphilis in Three Surgical Cases";

Dr. Charles J. Imperatori presents "Nonopaque Foreign Bodies in the Bronchi"; While Dr. Gaston Labat, presents "The Trend of Subarachnoid Block."

ACUTE OSTEOMYELITIS

This report made by Dean Lewis, Baltimore (Journal A. M. A., March 9, 1929), is based on a study of 229 cases of osteomyelitis. A differentiation is not made between acute and chronic cases. In one of the cases cited, operation was performed within eleven hours after the onset. The patients were, however, rarely admitted to the hospital until from four to seven days after the beginning of the attack. There are included in this study eighty-eight cases of osteomyelitis of the femur. Nine of these patients died. Three deaths followed attempts at removal of large, almost total, sequestrums. This indicates that too radical a procedure should not be attempted in patients whose resistance has been lowered by long illness. The remaining six deaths were due to general pyogenic infections with metastases. Three of the patients with osteomyelitis of the femur were unimproved; fifty-nine, or 67 per cent, were discharged as improved, while seventeen, or 19.3 per cent, were discharged as cured. The percentage of improvement is high, but improvement usually means a discharging sinus or unhealed wound and indicates that surgery has not attained its aim—a healed wound. Some effusion or other evidence of joint involvement was noted in a relatively large proportion of cases. The knee was involved in forty-four of the eighty-eight cases, the hip in twenty-five and the hip and knee in seven. There were sixty-one cases of osteomyelitis of the tibia; two deaths occurred in this group. The two deaths were due to general infections. There were sixty-three cases of osteomyelitis of the humerus. One death occurred in this group; forty-nine patients were discharged as improved, one as unimproved and twelve as well. The elbow was involved in twenty-one and the shoulder in nineteen of these cases; both the shoulder and elbow were involved in five, and in 64.5 per cent one or both joints were involved. One cannot but be struck by the number of patients, about 50 per cent who were discharged as improved. Multiple operations were required for recurring attacks and abscesses. Because such recurrences are so common, some surgeons believe that osteomyelitis is never cured. The author believe that some of the operations which have been suggested for osteomyelitis are harmful. Any operative procedure employed in the treatment of acute osteomyelitis should have as its object the prevention of general infections, the limitation of sequestration or reduction in the size of the sequestrums, and the prevention of deformities. As is indicated by the figures cited in the 229 cases discussed in this series, acute pyogenic osteomyelitis still remains a surgical problem. The importance of an ealy diagnosis is emphasized. The diagnosis must be based on pain. which is the constant, predominant and earliest symptom of acute osteomyelitis, and a definite localized point of tenderness limited in area and not found over the surrounding bone. During the first twenty-four to thirty-six hours, pain, localized tenderness and fever may be the only symptoms of the disease, as the inflammatory process is confined to the interior of the bone and has not yet reached the periosteum, when redness, edema and induratin of the skin are noted. If the sequelae of acute osteomyelitis—discharging sinuses or reformation of sequestrums—are to be avoided, the diagnosis must be made early and an early operation performed. When the diagnosis is made the supporting focus should be drained by a trephine opening or a burr, and the tension immediately relieved. If a subperiosteal abscess has formed, this should be drained and further stripping of the periosteum or injury of the bone carefully avoided. Removal of the sequestrum should be delayed until it is fully separated, for it is impossible to determine what bone is viable before separation has occurred, and the injury of surrounding viable bone be followed by sequestrum formation later. The radical operation does not lessen the incidence of general infection. Radical removal of an infected marrow with a curet may favor the development of general infections and destroy bone. The development of deformities should be prevented. The surgeon can prevent these. The possibility of a dorsal dislocation of the hip should always be kept in mind in inflammatory processes about the hip, especially in osteomyelitis of the upper and posterior part of the rim of the acetabulum, which is supplied by an artery that may be closed by an infected embolus. Improvement in the treatment of acute osteomyelitis depends on early diagnosis and the resort to drainage of the inflammatory focus in the bone. Periosteal stripping should be prevented. If a subperiosteal abscess has formed, this should be incised. Removal of the sequestrum should be postponed until it has completely separated, so that in removal healthy surrounding bone will not be injured by operative procedures. Trauma to surrounding bone may lay the foundation for the formation of a new sequestrum.

ACUTE YELLOW ATROPHY OF LIVER FOLLOWING ADMINISTRATION OF OXYL IODIDE

S. D. Anderson and D. P. Teter, Chicago (Journal A. M. A., July 13, 1929), state that cases cited in the literature suggest that cinchophen in its various forms is a source of danger to certain patients. The danger does not appear to be proportional to either the amount of the drug taken or the period of time of its administration but to be dependent on some idiosyncrasy or other condition in the patient. The data available are insufficient to permit any opinion as to the nature of the possible factors that are responsible for the special susceptibility to the action of this drug. Oxyl iodide is used, like cinchophen, in the treatment of chronic arthritis, neuritis and myositis. It is said to contain "one part of iodine to five parts of phenylcinchoninic acid, two parts of the latter in chemical union with one part of iodine." The drug is a mixture of two parts of cinchophen chemically combined with one part of iodine and three parts of uncombined cinchophen; that is, 83.3 per cent cinchophen and 16.7 per cent iodine. The authors report a fatal case of oxyl iodide poisoning resulting from taking approximately 600 3-grain tablets of this drug during 8 months. The autopsy report is given in detail.

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NOTE—Corrections and additions to the above list will be cheerfully accepted.

XXIII INDEX TO CONTENTS 1930

AUTHORS

Allen, Duff S., St. Louis ... 400
Allen, V. K., Tulsa ... 328
Blesh, A. L., Oklahoma City ... 8
Bondurant, C. P., Oklahoma City ... 302
Brake, Charles A., Norman ... 118
Buchan, Evelyn, Duncan ... 88
Bulloch, J. F., Ardmore ... 121
Carson, F. L., Shawnee ... 343
Champlin, Paul P., Enid ... 41
Cochran, R. L., Caddo ... 82
Cook, W. Albert, Tulsa ... 371
Coughlin, W. T., St. Louis ... 369
Davis, J. E., McAlester ... 110
Dell, W. J., McAlester ... 108
Denny, E. Rankin, Tulsa ... 147
Downey, D. S., Chickasha ... 20
Dwyer, H. L., Kansas City, Mo. ... 245
Field, Julian, Enid ... 57
Ferguson, E. S., Oklahoma City ... 181
Fite, Wm. P., Muskogee ... 233
Gallaher, F. Clinton, Shawnee ... 250
Garrison, Geo. H., Oklahoma City ... 392
Gastineau, F. T., Vinita ... 151
Gayman, B. R., Foss ... 87
Glismann, M. B., Okmulgee ... 387
Goldfain, E., Oklahoma City ... 80-191
Gregg, O. R., Enid ... 43
Griffin, D. W., Norman ... 238
Hall, Clark H., Oklahoma City ... 297
Hayes, Basil A., Oklahoma City ... 335
Hayes, P. L., Vinita ... 359
Heatley, John E., Oklahoma City ... 300
Hollingsworth, J. I., Waurika ... 93
Hudson, F. A., Enid ... 47
Hughes, J. E., Shawnee ... 343
Isvekov, V. G., Shawnee ... 310
Jackson, J. B., Kansas City ... 242
John, Henry J., Cleveland, Ohio ... 1
Johnson, James C., McAlester ... 114
King, J. Berry, Oklahoma City ... 199
Kuyrkendall, L. C., McAlester ... 373
Lamerton, W. E., Enid ... 48
LaMotte, Geo. A., Oklahoma City ... 71
Lattimore, J. L., Topeka, Kansas ... 108
LeMaster, D. W., Tulsa ... 146
Livermore, W. H., Chickasha ... 339
Long, Leroy Downing, Oklahoma City ... 325
Long, Leroy, Oklahoma City ... 69
Long, Wendell, Oklahoma City ... 406
Maddox, W. G., Dallas, Texas ... 341
Mason, W. S., Claremore ... 265
McBride, Earl D., Oklahoma City ... 76
McCarley, T. H., McAlester ... 102
McClure, H. M., Chickasha ... 85
McDonald, J. E., Tulsa ... 142
McFarling, A. C., Shawnee ... 308
McHenry, D. D., Oklahoma City ... 236
McInnis, A. L., Enid ... 54
McMahan, A. M., Duncan ... 155
Melloy, R. C., Claremore ... 265
Mraz, J. Z., Oklahoma City ... 333
Nagle, Patrick S., Oklahoma City ... 353
Neilson, W. P., Enid ... 52-266
Park, J. F., McAlester ... 101
Pearce, C. M., McAlester ... 112
Penick, Grider, Oklahoma City ... 15
Pigford, Russell C., Tulsa ... 138-274
Rankin, Fred W., Rochester, Minn. ... 24
Rice, C. V., Muskogee ... 22-279
Rieley, Lea A., Oklahoma City ... 116
Riley, John W., Oklahoma City ... 74
Robinson, G. Wilse, Kansas City, Mo. ... 363
Rosser, C. M., Dallas, Texas ... 195
Rucks, W. W., Oklahoma City ... 12
Salmon, W. T., Duncan ... 306
Sanger, Fenton M., Oklahoma City ... 269
Shepard, R. M., Tulsa ... 134
Shoemaker, H. H., Oklahoma City ... 403
Taylor, C. B., Oklahoma City ... 301
Taylor, W. M., Oklahoma City ... 299-385
Terrell, T. C., Ft. Worth, Texas ... 158
Trainor, Wm. J., Tulsa ... 273
Turley, L. A., Oklahoma City ... 193-403
Vandever, H. F., Enid ... 46
Veatch, Everett P., Okeene ... 397
Wails, Theodore G., Oklahoma City ... 186
Watson, F. L., McAlester ... 103
Wells, W. W., Oklahoma City ... 17
West, W. K., Oklahoma City ... 302
White, Arthur W., Oklahoma City ... 253
White, Oscar, Oklahoma City ... 284
Wiley, A. Ray, Tulsa ... 187
Woods, L. E., Chickasha ... 86
Young, Antonio D., Oklahoma City ... 184

A

Abdomen, Significance of certain physiologic facts in surgery of ... 242
Abscess of the lung ... 139
Abscess, prostatic ... 43
Abscess, subphrenic ... 93
Achondroplasia, a case of ... 130
Actinomycosis ... 41
Acute head injuries, treatment of ... 184
Address, President's ... 181
Allergic purpura ... 295-383
Allergy ... 65
Allergy, recent advancements in ... 147
Alopecia, causes and treatment of ... 97
Amabiasis, present day interest ... 253
Amytal, as an anesthetic ... 341
Anesthesia, Amytal ... 341
Anesthesia, spinal ... 339
Anesthesia, present day trend of surgical ... 233
Anesthesia, surgical viewpoint ... 343
Angina, Ludwig's ... 101
Ankle sprains, treatment of ... 64
Ankylosis, treatment by Arthroplasty ... 142
Annual Session, the next, May 1930 ... 60
Annual Session, The ... 126
Antirachitic, relation of the altitude of the sun to ... 133
Appendix, treatment and after care ... 83
Arthroplasty of the knee ... 177
Arthritic, pain in relation to changes in weather ... 264
Arthritis, chronic deforming ... 295
Arthritis, the colon in relation to chronic ... 380
Arthritis, management of gonorrheal ... 37
Arthritis, rheumatoid conditions ... 74
Arthritis, rationale underlying physiotherapy ... 414
Arthritis, study of colonic irrigation in the therapy of chronic ... 296
Arthritis, vaccine, therapy ... 348
Asthma, reflex itching in ... 255
Asthma, studies in ... 134
Auricular, fibrillation ... 52

BOOKS

Burns, Types, Pathology and Management, George T. Pack 350
Cancer of the Breast, Wm. Crawford White 350
Clinical Nutrition and Feeding in Infancy and Childhood, I. Newton Kugelmass 321
Dietetics and Nutrition, Maude A. Perry 321
Diseases of the Blood, Paul W. Clough 133
Diseases of the Chest, George W. Norris 133
Diseases of the Skin, George Clinton Andrews 350
Gonococcal Infection in the Male, Abr. L. Wolbarst 321
Infant Nutrition, Williams McKim Marriott 262
Manual of Diseases of the Eye, Charles H. May 321
Manual of Physical and Clinical Diagnosis, Otto Seifert 262
Mayo Clinic, Collection of papers of 262
Medical Revue and Prologue and A Good Many Scenes, Morris Fishbein 322
Minor Surgery, Arthur E. Hertzler 262
Obstetrics for Nurses, Charles B. Reed 261
Orthopedic Surgery, Willis C. Campbell 97
Personal and Community Health, Clair Elsmere Turner 321
Physical Diagnosis, Richard C. Cabot 321
Research and Medical Progress and Other Addresses, J. Shelton Horsley 97
Steadman's Medical Dictionary 350
Surgical Clinics of North America, (Chicago Number) 262
Surgical Clinics of North America, (Lahey Number) 97
Surgical Clinics of North America (Mayo Clinic Number) 132
Surgical Clinics of North America (Southern Number) 350
Surgical Diagnosis, by 42 American Authors 133
Surgical Diagnosis, Vol. 3, by 42 American Authors 262
The Long Trek, Richard L. Sutton 351
The Normal Diet, W. D. Sansum 262
Treatment in General Practice, Harry Beckman 97
Treatmentof Skin Diseases, Noxon Toomey 349
Tropical Medicine in the United States, Alfred C. Reed 321
Uterine Tumors, Charles C. Norris 350

B

Back injuries 114
Birth Palsy, knowledge of 415
Bismuth, absorption 264
Blastomycosis 132
Blood & functional tests as aid in diagnosis 310
Blood picture, of some drugs 403
Bolutism, from ingestion of ripe fruits 160
Bronchus, benign neoplasms of the 64
Burns, cancer following 414
Burns, local treatment of 414

C

Cancer, clinic, Baltimore 291
Cancer, casual factor of skin 96
Cancer, cervix uteri, treatment of 406
Cancer, danger of manipulation and massage 59
Cancer, diagnosis of early uterine 98
Cancer of the lung 294
Cancer, following burns 414
Causation, recognition, prevention and treatment (Overton) 131
Causation, recognition, prevention and treatment (Dyson) 131
Celiac, disease from standpoint of vitamin deficiency 279
Cervix, uteri 102
Cerebrospinal fluid, where absorbed 134
Colon, surgical lesion of the right half
Coma, difficulties in diagnosis of 38
Confinement, care of patient before and after pregnancy 54
Corpus Luteum Lipo-Lutin 387
Council meeting 207-208

COMMITTEE AND DELEGATE REPORTS

Committee on Cancer Study and Control 173
Committee on Conservation of Vision 214
Committee on Contract and Industrial Practice 174
Committee on, Crippled Children 175
Committee on, Medical Economics 174
Committee on, Medical Education 171
Committee on, Scientific work 172
Committee on, Tuberculosis 171
Committee Report, Delegates to the American Medical Association, Portland Session 31
Committee Report, Delegates to the American Medical Association Detroit Session 318
Report, Secretary-Treasurer-Editor, Dr. C. A. Thompson 166

D

Dental Caries, medical aspects of 385
Dermatoses, Industrial 131
Dextri-Maltose, feeding of infants 316
Diabetes, calcification of vessels in 289
Diabetes, mellitus, review of 250
Diabetes, practical points in treatment of 86
Diabetes, problems in 1
Diagnostic discrepancies 82
Digitalis, stability of 275
Digitalis, bogey of heart-block in 382
Digestive tract, emotion in 255
Dislocation, hip joint 95
Drugs, experimental, blood picture 403
Dyskeratosis, follicularis vegetans 349
Dystocia, relative variations which cause 17

E

Ear, Middle, infection in 308
Ear Work, some don'ts in 236
Ectodermal Hereditary Dystrophy 65
Elbow, Detachment of the Epiphyses 95
Emotions and Digestive Tract 255
Enterostomy, Why it may not function 47
Epidermoloysis, Bullosa, Acquired 132
Erythema, Epidemic of infectious 96
Ethylene 375
Exostosis 65
Extension Service, State University, Annual Session, Shawnee 126
Eye Injuries 47
Eye Work, some don'ts in 236
Eyeball, Foreign Bodies 371

EDITORIAL

Annual Meeting Dates 410
Antivivisection Problems 410
Cancer, Danger of Manipulation and Massage 59

Chemical Hysterectomy 256
County Officers 317
Economic Aspects Affecting the Physician 317
Enid Hospital and Medical Resources 60
From the Sublime to the Ridiculous 345
Hospital Service and the Cost of Medical Care 92
Hyperthyroidism, Treatment of by Radium and X-Ray 29
Licenses, Revoked Can Not Be Restored 378
McAlester Hospitals 123
"Members" and "Fellows" of American Medical Association 203
Neuritis Alcoholic, Multiple 204
New School Child 290
Oklahoma City as a Clinic Center 410
Oklahoma City Clinical Society 345
Otitis Media An Uususpected Menace 346
Our new Picture Films 346
Prevention of Malpractice Claims 162
Shawnee, Attractions of 123
Subphrenic and Liver Abscess 93
Taxing the Physician by License 375
To Those Who Serve 161
Welcome Shawnee To Our City 161
Young, Antonio D., Memorial To 205
Editorial Notes, Personal and General 34
Editorial Notes, Personal and General 61
Editorial Notes, Personal and General 94
Editorial Notes, Personal and General 127
Editorial Notes, Personal and General 163
Editorial Notes, Personal and General 205
Editorial Notes, Personal and General 256
Editorial Notes, Personal and General 291
Editorial Notes, Personal and General 319
Editorial Notes, Personal and General 347
Editorial Notes, Personal and General 379
Editorial Notes, Personal and General 413

F

Feeding, Infant, Simplicity in 245
Fibrillation, Auricular 52
Fistula, Vesico-Vaginal 333
Forearm, Fractures, Local Anesthesia in 37
Foreign Bodies in Eyeball 371
Fracture, Avulsion Os Calcis 296
Fracture, Local Anesthesia Reduction 37
Fracture, Medical Treatment of 80
Fracture, Skeletal, Direct Traction in 95
Fracture, Standard Treatment of 76
Fracture, Treatment of Compound 103
Fungus Diseases of the Skin 96

G

Gall Bladder, Inflammation of 69
Gastric Digestion of Meat 382
Gastric and Duodenal Ulcer 284
Glandular Fever, Acute 316
Goitre, Medical Treatment of 12
Goiter, Toxic 325
Goiter, A Working Knowledge of 85
Golf, or Not to Golf 263
Gonorrheal Arthritis, Management of 37
Granuloma, Annulare, Etiology of 66
Gynecology As Practiced in Oklahoma 15

H

Head Injuries, Acute; Treatment of 184
Healing of the People 195
Hearing, Effects of Gas Explosions on 306
Heart Block 382
Heart Disease, Objective Findings 138
Heart in Surgery 273
Heart, Respiratory Infections in 274
Hematoporphyria Congenita 260
Hip, Joint Reconstruction in Congenital Dislocation 381
Hip, Treatment of Congenital Dislocation 348
Hospital, Essentials of a Successful 88
Hospital, National Day 127
House of Delegates, 208-209-210-211-212-213 214-215-216-217
Hydatidiform, Mole, Report of Case 87

I

Infant Feeding, Simplicity In 245
Infection Due to Peritonitis 20
Injections of Quinine in Varicosities 95
Insane, Care and Classification of 359
Insulin Coma, Difficulties in Diagnosis 38

J

Jaundice and Anthisyphilitic Treatment Lathe and DeLarue 259
Jaundice Treatment of Para-Arsenical 259
Jaundice With Anti-Syphilitic Therapy, Jacob and Roberti 258

K

Keratosis punctata 413
Kidney, Infantile 122

L

Lead, Excretion of 316
Leukosarcoma 414
Lichen Planus, unusual 414
Liver, Extract, in Toxemia 255
Ludwig's Angina 101

M

Medical Economics, rural 397
Medicine, Rational Development of 266
Meningitis, Epidemic, Cerebro-Spinal 112
Meningitis, meningococcic 392
Metatarsals and Their Injury 347
Molluscum, contagiosum and Turkish Baths 413
Muscular Atrophy, Progressive 265
Myocardium, The 71

N

Narcolepsy, Following Epidemic Encephalitis 98
Narcotic Abuse, suppression 415
Nervous System, Vegetative; Physiology and Pharmacology 363
Neuralgia, Trigeminal 369
Neuritis, Alcoholic, Multiple 204
Neuritis Miltiple, Jamica Ginger 191
Neurosis, Traumatic 176
Nightingale, Florence; A Tribute To 199
Nose and Throat Work; Some Don'ts in 236

OBITUARIES

Ballaine, Charles W 320
Hays, James Hampton 36
Jeter, Allen J 36
Kimmons, S. Hall 164

Lain, Ernest H. 292
Lively, Robert A. 128
Looney, R. Elmore 35
Mead, William B. 26
Mullins, J. Arthur 320
Poyner, Eiton E. 413
Rice, Edgar E. 94
Smith, J. C. 292
Taylor, James Isaac 128

O

Orthopedics, ankle sprains, treatment of 64
Orthopedics, back injuries 114
Orthopedics, poliomyelitis, protective action of convalescent serum 37
Os Calcis, avulsion fracture of 296
Osgood, Schlatter's disease 260
Osteitis, fibrosa, generalized 260
Osteochondritis, dessicans 115
Osteomalacia, senile 177
Osteomyelitis, acute infection, conservative treatment 65
Otology and General Medicine 110

P

Paget's disease 130
Paralysis, toxic (Jakeitis) neuro-pathology 193
Paralytic deformities of the foot, treatment of 380
Paresis, general, treatment of malaria 349
Pastes, action of 66
Perforation, gastric and duodenal ulcer 284
Peritonitis, management of in pelvic infection 20
Phemphigus vegetans 349
Phenylhydrazine, untoward effects of 296
Phrenic nerve, exiaresis of in Tuberculosis 320
Phrenicotomy, Changes in Respiratory mechanism 381
Pigment, problems of formation 294
Pneumonia, hyperventilation with carbon dioxide and oxygen 353
Pneumothorax, spontaneous, non-tuberculous 64
Polyarthritis, effects of ganglionectomy 415
President's address 181
Program, annual session at Shawnee 38
Prostatic abscess 43
Pruritus Ani, treatment of 413
Psychiatry in medicine 238
Psychosis, post Volstead alcoholic 118
Pyelitis in children 57
Pyelonephritis in women 269

Q-R

Radiotherapy, crural ulcers and similar disturbances 259
Rectal stricture 328
Respiratory infections in the heart 274
Retina, detachment of 373
Rhinoscleroma, diagnosis and treatment of 66
Ringworm of the foot 295
Roentgen rays, bacterial action 294
Roster for 1930 219

S

Sarcoid, Boeck's report 131
Saurkraut juice as antirachitic treatment 22
Sclerodema, calcium metabolism in 349
Sclerodema and calcinosis 96
Sinuses 155
Skin lesions among tar workers 295
Spondylitis and trauma 260
State Board of Medical Examiners report, March 11-12, 1930 178
State Board of Medical Examiners report, June 10-11, 1930 323
State Board of Medical Examiners report, September 9-10, 1930 383
Sterility, factors in causation 58
Streptococcic Septicemia, from middle ear infection 308
Stricture of the rectum 328
Surgery of the abdomen, significance of psychologic facts 242
Surgery in the heart 273
Surgery, urological diagnosis in 355
Subphrenic and liver abscess 93
Syphilis, associated with jaundice (Lathe and DeLarue) 259
Syphilis, biliary retention in 259
Syphilis, clinical studies of infection 66
Syphilis, in children, symptoms, diagnosis 299
Syphilis, infancy and childhood, x-ray manifestations 300
Syphilis, jaundice due to treatment (Jacob and Roberti) 258
Syphilis, laboratory aids in diagnosis 158
Syphilis, neuro, early treatment of patients 349
Syphilis of the bone in children 302
Syphilis, relation of to internal medicine 302
Syphilis and the new born 297
Syphilis, treatment by thermotherapy 349
Syphilis, treatment of in the new born 301
Syphilitic headaches 349

T

Tar and skin lesions 295
Thallium, deaths from 295
Thyroid glands as a surgical problem 8
Toxemia, pregnancy, liver extract in 255
Transactions, 38th annual session, Shawnee, May 26-28, 1930 206
Transudates and exudates 146
Traumatic abdomen, acute 187
Traumatic neurosis 176
Trichoepithelioma, knowledge of 259
Trichophyton allergy 65
Trigeminal neuralgia 369
Tularemia 116
Tulsa Academy of Medicine 379
Tuberculosis, appearance of symptoms and bearing on medical advice 36
Tuberculosis, effect of parathyroid extract and calcium in pulmonary 175
Tuberculosis, factors involved in the decline in 258
Tuberculosis, healing of 381
Tuberculosis, infection of school children, advanced 381
Tuberculosis, research in 258
Tuberculosis in children 36
Tuberculosis, intestinal studies in 226
Tuberculosis, intestinal treatment 347
Tuberculosis, irradiated ergosterol in 320
Tuberculosis, laryngeal treatment 347
Tuberculosis, and phrenicotomy 320
Tuberculosis, phrenicoexaresis in pulmonary tuberculosis 129
Tuberculosis, (phthisis) average duration of fatal 176

Tuberculosis, primary lesion on the lip 96
Tuberculosis, pulmonary, changes in the fingernails 176
Tuberculosis, pulmonary, surgical treatment of 129-400
Tuberculosis, thoughts on the early case 261
Tuberculosis, treatment of the early case 320
Tuberculosis, Vincent's agina and fusospirochetal diseases of the lungs 63

U

Urological diagnosis in general surgery 355

V

Vacinne therapy 91
Varicose ulceration, quinine injections 95
Varicose veins, injection treatment 294
Varicose veins and sequellae 382
Vesico-vaginal fistula 333
Vitamins 151
Vitamin deficiency and cealic disease 279
Von Recklinghausen's Disease 132

W

Weather manufactured 383

X

X-ray, treatment of wounds 348